

Volume 4  
Issue 5

# RISC USER

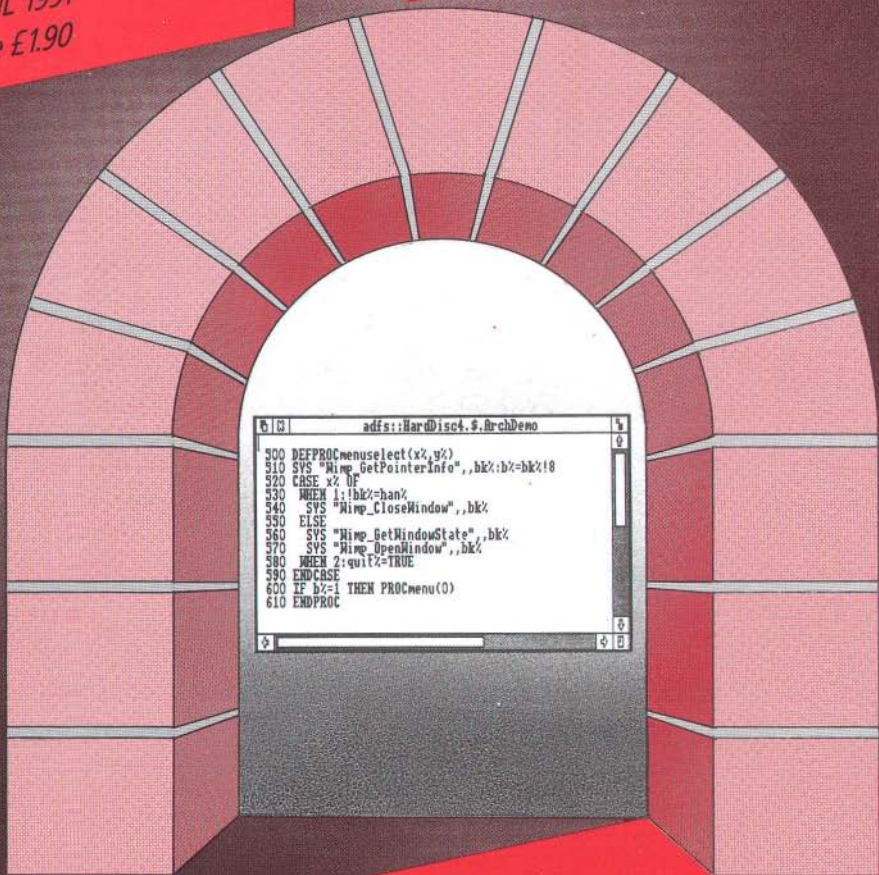
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*Revelation Reviewed*

*ADFS Disc Examiner*

*Using DTP for Letter Writing*

*Creating a Boot Application*



*Archway 2*

The magazine and  
support group  
exclusively for users  
of the Archimedes



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# RISC USER

## THE ARCHIMEDES MAGAZINE AND SUPPORT GROUP

RISC User is published by BEEBUG Ltd.  
Co-Editors:

Dr Lee Calcraft, Mike Williams

Assistant Editor: Kristina Lucas

Technical Editor: Alan Wrigley

Technical Assistant: Glynn Clements

Production Assistant: Sheila Stoneman

Advertising: Sarah Shrive

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## REVIEWS AND REVIEWERS

Many users read a magazine like *RISC User* for its reviews, among other things, in order to keep up to date with new products as well as for advice and guidance when contemplating a new acquisition. In recent months there have been many new products appearing for the Arc, and we have been able to extend the number of editorial pages to provide better and more extensive coverage of new products.

In planning reviews, we try to cover a range of products in each issue, from software to hardware and including both major applications and products on a smaller scale. We aim to bring you reviews of new products as soon after their launch as possible, but with developers' timetables changing, sometimes on a daily basis, and our own more rigid schedule for publication, some reviews appear a little later than we might wish. And because of the pressure for space in the magazine, it is impossible for us, or any magazine, to review all products which are released. Indeed this would not necessarily be desirable given the highly specialised nature of some offerings.

That brings us to a second point. Some users seem to believe that writing a review is a way to get all the latest software or hardware free of charge. In fact, we are selective in whom we commission to write a review, and the task itself is time-consuming if done thoroughly and properly. Reviews must often be written in a relatively short timescale, they must be objective, and be produced with the interests of all readers

firmly in mind. In addition, readers want facts and answers not questions or vague information in the reviews which they read.

If that has not put you off, then we are always interested to hear from anyone who would like to be considered as a reviewer on an occasional or regular basis. If you are interested in having your name added to our list then please write to me. Tell us what system you have, and what major additional software and hardware you use. What applications are you familiar with, and what do you consider your principal areas of knowledge and expertise when it comes to the Archimedes? Some indication of your work or professional background would also be helpful (e.g. in business, education etc.).

Not least, you must be able to write in good clear grammatical English, and in a style which readers will find interesting. If you believe that you may be able to help us, then please write giving as much relevant information as possible. You must also submit at least one example of your journalistic capabilities already published, or undertake a trial review of a major piece of software or hardware of your choice, suitable for inclusion in *RISC User* magazine. It does not matter if the product you choose has already been reviewed, or whether (in that case) you reach the same conclusions as the original reviewer. Address all correspondence to the Editor. Remember that we do pay for all work published.

**M.W.**

# **Is your 310 short of memory?**

**Watch this space  
next month**

**BEEBUG**

*The leaders in quality memory  
upgrades*

## PHOTOGRAPHY ON THE ARC

Solitaire has released *PC Picture Kit*, which allows you to take photographs anywhere, and then import them to an Archimedes in a few seconds. The kit uses the Canon Ion camera, which incorporates a charge coupled device to store images from the camera lens onto a magnetic disc. Up to 50 pictures can be stored on each disc, and the disc can be repeatedly re-used. To transfer an image to the Arc, a video capture board is supplied, which digitises the picture at 24 bits per pixel, and can create either a 256-colour sprite, or a 256 grey scale monochrome sprite. The kit contains the camera, the video capture board and all the necessary software, as well as numerous accessories including a macro stand, a teleconverter lens, both battery and mains power units for the camera and an RF unit to enable the camera to be connected directly to a television. The kit costs £1437.50 inc. VAT, and further details can be obtained from Solitaire, 6 The Quay, St Ives, Huntingdon PE17 4AR, tel. (0480) 495608.

## BEEBUG ON MICRONET

The BEEBUG database on Micronet has now moved from its original base node on page 800909 to a new one on page 800708. The keywords \*BEEBUG and \*DATABUS will still take you to the front page or the DATABUS menu. At the same time, the retail price lists have been removed from the database as it is proving impossible to keep them up to date. Instead, a free retail catalogue will be supplied to anyone who requests it, and there will be a new section on the database devoted to current special offers, including secondhand and shop-soiled items. It will still be possible to place orders and renew subscriptions via Prestel. An expansion of the editorial section is also planned. This will include more news and information about BEEBUG and all things Acorn. The hints and tips section may also be increased, and further areas may be added to enhance the database.

## UNARMED COMBAT

Following last month's story, the plot regarding ARM3 chips thickens. VLSI, which

manufactures the Acorn-designed chip, has published a revised data sheet for the device. At first sight, the major change is a reduction in maximum clock speed to 25MHz, which would result in a downgrading of all ARM3-based products; a move already taken by Acorn for the new A540. However, a further, less obvious, change has been made to the specification of the maximum period of the clock input from the memory controller chip MEMC. This has been reduced from 10000ns to just 250ns. Unfortunately, the clock period can easily exceed this during IO cycles and DMA activity. The bombshell effect of this seemingly minor change is that if you take the new specification literally, the ARM3 cannot be used at all in the Archimedes any more!

In practice, a VLSI spokesman said that a percentage of chips would be sufficiently above spec to work satisfactorily. However, there are no clear guidelines as to what this figure may be, but it could be that as few as 20% of the chips are usable. Furthermore, as all chips supplied in future will match VLSI's new specification, the company claims it has no obligation to replace the potential 80% that may fail in the Archimedes.

VLSI says that the need for re-characterisation of the ARM3 stemmed from unacceptably low yields when the chip was finally put into mainstream production at the end of last year. It is thought that the company is trying to return to the original specification, but this will not be for several months at least. In the mean time, a question mark must hang over the availability of all ARM3-based products.

## DESIGN CONCEPTS

New from Longman Logotron is *Concept Designer*, which provides the facility to create and use overlays on a Concept Keyboard. The program can be configured such that conventional keyboard keypresses can be simulated in specific areas of the overlay. It will work with most RISC OS compliant programs, and overlays and their associated files can be transferred between applications.

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File Handling for All is a comprehensive book which covers all the requirements of data storage and processing by computer, using the popular BBC Basic programming language for the examples. It is aimed at anybody interested in File Handling and Databases, whether beginners or more advanced users, and will appeal to all who want to learn more of this important subject.

The book starts with an introduction to the rudiments of file handling, and in the following chapters develops an in-depth look at the different types of files e.g. serial files, indexed files, direct access files, and searching and sorting. A separate chapter is devoted to hierarchical and relational database design, and the book concludes with practical advice on developing file handling programs.

The associated disc (£4.75) contains complete working programs based on the routines described in the book and a copy of Filer, a full-feature Database program.

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Herts AL1 4JS  
Telephone: 0727 40303  
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Please note postage for the discs is £1 for Europe and £2.40 elsewhere; the book is £1.60 Europe and £4.80 elsewhere.

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# • News • News • News • News •

The package comes with a program which will allow overlays to be created on machines which are not fitted with a Concept Keyboard, by emulating its action on screen. *Concept Designer* costs £24.00 inc. VAT, and further details can be obtained from Longman Logotron Dales Brewery, Gwydir Street, Cambridge CB1 2LJ, tel. (0223) 323656.

## ENHANCE YOUR GRAPHICS

The Serial Port has announced a *Graphics Enhancer* board, which adds a 24-bit colour palette to the Arc. This will enable you to choose from a possible 16,777,216 colours. In 256-colour Desktop modes this allows, for example, a true 256 grey scale, ideal for DTP work etc. Outside the Desktop, a maximum of 65536 colours can be displayed at any one time. The board comes complete with software which includes a VIDC enhancer, and all currently defined modes are supported, including CC's special Impression modes. The *Graphics Enhancer* board costs £194.35, and further details can be obtained from The Serial Port, Burcott Manor, Wells, Somerset BA5 1NH, tel. (0243) 531194.

## HARD SPACE

DR Computer Products has announced *SPACE* (Second Peripheral Auxiliary Chassis Expansion). This is a hardware kit which enables you to fit a second hard drive inside a 400 or 500 series Archimedes. The *SPACE* kit contains all the necessary metalwork and cables etc., and fits into the machine where podules 1 and 3 are normally located. The drive is bolted securely into the chassis, which is supported by the backplane. Drives up to 40 Mbytes can be used, or even larger if an external power supply is available. The *SPACE* kit costs £32.95 inc. VAT. For more details, contact DR Computer Products at Unit 20-21, Enterprise House, 44-46 Terrace Road, Walton-on-Thames KT12 2SD, tel. (0932) 240432/566435.

## PIPEDREAM UPGRADE

Colton Software's *PipeDream* 3 has now been upgraded to version 3.1. The new version

includes the HotLink capability (see the News pages in Volume 3 Issue 9), and also features a new DTP Export program, overlaying text and pictures, and foreign characters in dictionaries, as well as a number of smaller improvements. *PipeDream* 3 costs £169.05 inc. VAT, and existing users of version 3.0 and later can upgrade free of charge. For further details contact Colton Software, Broadway House, 149-151 St Neots Road, Hardwick, Cambridge CB3 7QJ, tel. (0954) 211472.

## MORE SHOW NEWS

Another All Formats Computer Fair will take place on 23 March 1991 at the New Horticultural Hall in Westminster. These fairs aim to provide a hunting ground for hardware and software bargains covering all types of micro, and previous fairs have proved very popular and successful.

Also coming up soon is the next Computer Shopper Show. This will take place at Alexandra Palace from 10-12 May 1991, and Acorn will be exhibiting at the Show.

Acorn is also signalling its intentions to broaden its market beyond the UK by exhibiting at the CEBIT exhibition in Germany, which is possibly the world's largest computer show. CEBIT takes place at the Hannover Exhibition Centre from 18-20 March 1991. Further details about the show can be obtained from Jona Gebauer at GMA mbH, Wandsbeker Chaussee 58, 2000 Hamburg 76, Germany.

## UPGRADED FORMS DESIGNER

MEWsoft has announced an upgrade to its *Forms Designer* package (reviewed in RISC User Volume 2 Issue 10). The package is now fully multi-tasking, and supports the RISC OS printer drivers and the Corpus outline font. For further details, including upgrade prices, contact MEWsoft, 11 Cressy Road, Hampstead, London NW3 2NB, tel. 071-267 2642.

**RU**

# ArcScan III

A new multi-tasking version of Arcscan, the customisable magazine database

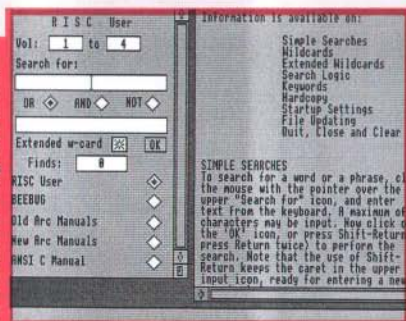
## New features for ArcScan III

- now includes subject and function index to Acorn's ANSI-C manual (Release 3)
- provides flexible keyboard search on any entry
- improved search logic - choice of 3 logical operators: OR, AND and NOT
- features dynamic memory management, returning unused memory to the Wimp
- uses dedicated ARM code routines enabling rapid information retrieval
- finds are displayed in a fast scrolling Wimp window allowing you to browse through all entries retrieved.
- fully user customisable allowing other databases to be automatically incorporated in the control panel display
- a new detailed manual and extensive on-screen help

Searching is almost instantaneous



The on-screen help in action



## ArcScan III contains the Following Databases:

- RISC User Volumes 1, 2 and 3
  - BEEBUG Volumes 1 - 8
- The Indexes to the following major Archimedes manuals:
- Basic User Guide (Arthur)
  - Programmer's Reference Manual (Arthur)
  - RISC OS User Guide
  - RISC OS Basic Manual
  - RISC OS Programmer's Reference Manual
  - ANSI C Manual (Release 3)

## It is simple to perform a search:

1. If you need to know about Obey Files, enter the words 'obey', 'files' and click on the AND logic. All finds in RISC User will be instantly displayed. You can now call up the Acorn Manuals indexes and repeat the search to get further references.
2. To find the SWI name for SWI &400D4, select the new Programmer's Reference Manual from the menu, enter "SWI &400D4", and the answer appears, complete with page references.

ArcScan III Disc + Manual

£14.95 members (£18.95 non-members)

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Please add 60p p&p. For upgrade, please send the old ArcScan II disc or label. When ordering please quote your name and membership number.

# Quite a Revelation

**Dave Futcher looks at a sophisticated image processing application from Longman Logotron called Revelation.**

The Archimedes is beginning to take on a biblical theme with first *Genesis*, the hypermedia package from Oak Solutions and now *Revelation*, from Longman Logotron. One wonders why Longman Logotron chose *Magpie* for their hypermedia package and not *Revelation*!

Nonetheless *Revelation* is the latest art and image processing package to appear for the Archimedes and BBC A3000 micro. It actually took two years to develop and has been field-trialed in 80 schools. The Archimedes is already well supplied with a wide range of art programs: *Paint*, *Artisan*, *Arctist*, *Pax*, *Leonardo*, *Flare*, *ProArtisan* and *Atelier* to name some. But could this new release be the state of the art in RISC OS image processing?

## DESIGNED SPECIFICALLY FOR SCHOOLS?

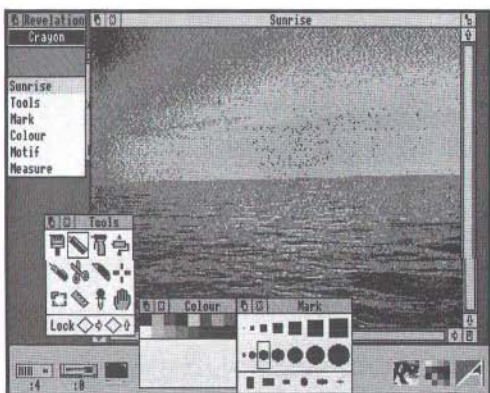
Many of the Archimedes art packages have already found their way into schools and colleges, where the Archimedes has dominated classroom computer art and design work. Strangely no one has previously designed a high level art package primarily for this market. And that is what Mick Cooper and Chris Forecast at Homerton College, Cambridge, have done with the support of the National Council for Educational Technology (NCET).

But *Revelation* should certainly not be considered just as an educational art package. It is in fact a very powerful image creator and processor. As well as being an excellent platform for painting and drawing images, you can take colour pictures from colour digitisers and scanners, read in artwork created with other packages, and begin to manipulate them and develop the image further.

## SO EASY TO USE.

Unlike quite a few Archimedes art packages, *Revelation* happily multi-tasks in a window in true RISC OS style. In a

way it's everything that Acorn's *Paint* should have been but wasn't quite! *Revelation* is considerably easier to use, it has a lot more features and runs considerably faster. So really there is no comparison! Much thought has gone into *Revelation* with the intention of making it very easy to use. The menus are extremely short and the majority of commands are available by clicking on icons representing the tools or facilities.

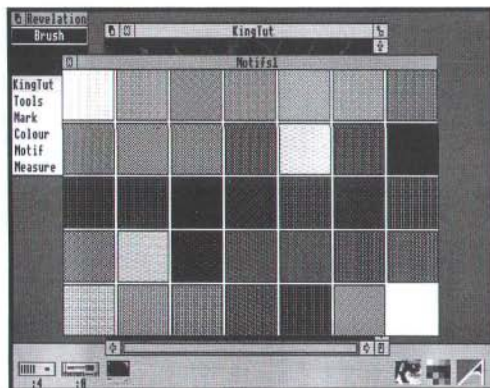


**Revelation's principal art menus: Tools, Colour and Mark**

Interestingly, *Revelation* runs in two operational modes, one called naturally *RISC OS* and the other *Special*. The first mode is true RISC OS, with menus available from the central mouse button, while *Special* has an on-screen main menu that sits initially alongside your first page. When options are selected by clicking, the corresponding sub-menu appears on-screen instead of sliding sideways from one menu to another. The *Special* operational mode has much to commend it, as in addition these menus can be "torn off" and placed anywhere on the Desktop to be used when required. This creates a very easy to use on-screen toolbox that avoids lots of clicking and selecting between menus, and lets you get on and create!

### WHOLE PAGE DISPLAY

Unlike some other RISC OS art packages, Longman Logotron has gone for the real windows approach with Revelation. When starting Revelation, by clicking on its icon on the icon bar, you are taken to the *Page Size* window, where clicking *Create Page* gives you a default page of a quarter screen size (9.03 x 7.22cm).



Revelation showing current range of Motifs

A larger page can be created by moving the pointer over the grid in the Page window and clicking. As well as full screen pages, it is possible to have pictures not limited by the screen size. The maximum is 63.22 x 57.80mm. A very important advantage of the Revelation window approach is that the user can see and work on parts of two or more pictures at the same time; in fact up to eight page windows can be open on the screen at once.

### ALL THE TOOLS THAT YOU COULD WANT

Revelation has a complete set of painting tools - everything you would need to create pictures or bit-mapped images on the Archimedes. Five sub-menus provide graphical tools and ways of modifying these tools. For example, if you select the paintbrush from the *Tools* menu, you can select its size and shape from the *Mark* menu, and give it a colour from the *Colour* menu. By making selections from the

*Measure* menu, measurements are also updated continuously on screen.

The *Tools* sub-menu contains twelve tools. These are best thought of in a number of groups. In the first group are the painting tools and a ruler. The painting tools include a *Brush*, and a *Crayon* both of which paint in the current colour or motif. The *Spray* deposits randomly distributed dots, the density of the dots being set by a slider control. The *Fill Roller* fills a bounded shape or every occurrence of the same colour (or pattern) - most useful. The *Drawing Pen* provides a number of geometric drawing options - rectangle, square, ellipse, circle and elastic lines. The *Pick Tool* is most innovative, especially when working in the 256 colour mode; with the *Colour* menu torn off you can use the bottom area of the menu as a sort of scratch pad for mixing colours together with the wash function, and then pick up newly created colours with the *Pick Tool* ready for use.

There are three tools for cut and paste work - *Scissors* allows rectangular areas of the page to be cut and copied, while the *Knife* cuts and copies irregular areas of the page. The *Paste Registration* tool puts a single copy into the position where the mouse pointer is placed. Additional features of the *Paste* tool are horizontal and vertical flips and rotations.

### MAKING MARKS

The shape and size of the mark your brush, crayon, pen and spray make on the page are controlled by the *Mark* menu. This lets you choose from a range of twelve square and circular sized brush shapes, which would seem to cover most people's needs but just in case it doesn't there is the possibility of designing your own by resizing another set of six shapes by pulling at grab handles. Setting these up is so easy, but why can't you save them? At present they are lost when you quit from Revelation.

### COLOUR PROCESSING

Revelation is full of possibilities for special effects - blending colours and overlaying washes come to mind, others of

## Quite A Revelation

them you will discover only after quite a bit of use. The use of *Motifs* is one that the manual makes very clear. Motifs can be created from parts of an image and then used to create patterning effects. They are in fact "elements" which can be pasted individually onto the page or used to create repeating patterns. As well as pasting whole motifs, you can use the Crayon and Spray to paint with parts of them.

The *Page* menu offers access to features that apply to the active page. Everyone will be pleased about the undo function that removes the last operation performed. This can be a real picture saver. Strangely, Revelation forsakes the usual RISC OS standard for setting the zoom and provides an eight position scale instead. Nothing really wrong here, until you want something different to the eight zooms provided.

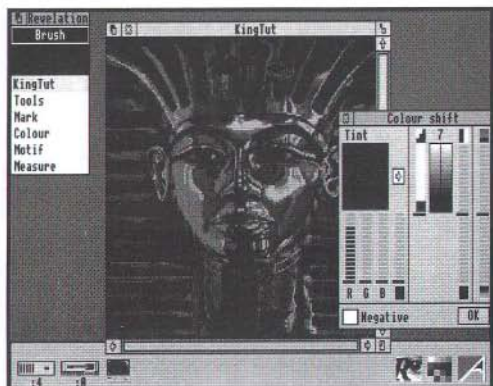
There is a *New View* option, which creates additional copies of the current page. This is ideal for looking at different views of an image, particularly when magnified. The most extensive feature of the *Page* menu is the *Colour Shift* option. This allows global adjustments to the colour of the current page. The *Tint* colour can be adjusted using the RGB sliders. The *Saturation* slider adjusts the overall colour from fully saturated to a grey-scale, while the *Contrast* slider can shift the image towards black and white or towards the colour average of the page. The *Threshold* slider makes it possible to define the tonal value of the colour. Finally, it is possible to render the current page in negative colours by clicking the *Negative* button. Quite something!

### EXTRA EXTRA

Revelation is also supplied with a utility application called *Revelation Xtra* which enables users to convert non bit-mapped documents and other data into a form that can be used by Revelation. At present, the version supplied (0.07) works with Draw files only, but by selecting *Snapshot* the built-in *Camera* appears on screen with its elastic rectangle which can be used to grab any area of the screen and save it to disc as a sprite file and then load it into Revelation.

## POUNDS TO POWER VALUE

In true Longman Logotron style Revelation comes with first class documentation which shows how easy this powerful imaging package is to use. In 20 colourful A4 pages you are taken a step at a time through the essential skills of using all the tools and features that Revelation offers.



Revelation picture with the powerful Colour Shift feature

With the release of Revelation, Archimedes and A3000 users have a very powerful and technically superb package for art and image creation and processing. It's a package for the future too. It will work in any screen mode, including the new RISC OS modes, and the size of the images it will handle will only be limited by the memory in the machine. Super high resolution images as large as 12 megabytes each are possible on the Archimedes A540 computer!

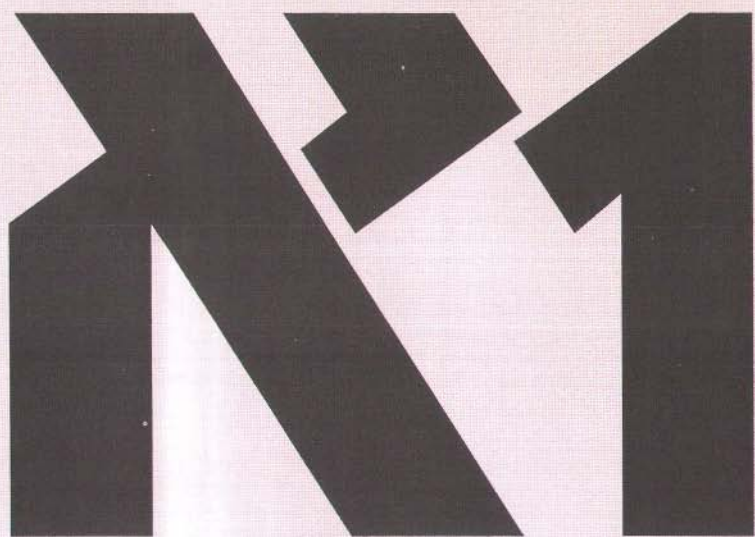
At £76.00 (plus VAT) Revelation is very reasonably priced in terms of pounds to power. It's a complete package which will enable most people to add the some real colour to their computing. Remember that computer artists don't just paint; with packages like this they can rotate, repeat and rearrange - quite a REVELATION!

Product  
Supplier

Revelation  
Longman Logotron,  
Dales Brewery,  
Gwydir Street,  
Cambridge CB1 2LJ.  
Tel. (0223) 323656  
£87.40 inc. VAT

Price

RU



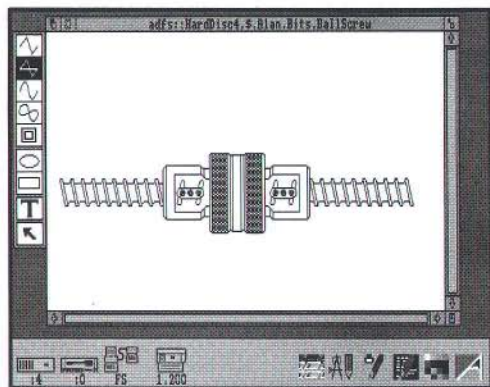
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# DXF - A Data Interchange File Format

*Jim Markland looks at the problems of converting graphic images to Arc formats, and explains the advantages of using DXF files to import vector graphics into Draw.*

Data may be encoded for computer usage in an almost limitless number of ways. That there are different ways of storing data becomes very quickly apparent when it is discovered that files of many types cannot be deciphered when dragged into Edit. There are all sorts of reasons why data may be stored one way rather than another: for speed of access, for compactness, for readability and so on. Indeed several packages take advantage of this, and at the same time increase their compatibility with other applications, by supporting more than one file type.



**A DXF file produced by WorraCAD and imported into Draw**

The data itself may come from one of many directions. If it is graphical it may, at a basic level, represent either vector (line drawings with or without colour fills) or raster images (pixel oriented). Collectors of public domain software may already have come across the problem of importing raster images from other computers. Why is this a problem? In part it arises because Acorn's sprite file format is unique to the Archimedes and is not standard on any other computer. Paint, as it presently stands, is incapable of reading

a screendump from any other computer; even after the hurdle of reading, say, a PC format disk has been overcome. The same is also true of vector graphics. The Draw file format is unique to the Archimedes and RISC OS, and presents a different problem in so far as vector graphics are concerned.

## PIXEL GRAPHICS

The solution to the problem of converting pixel based images is to use a conversion utility such as Acorn's ChangeFSI or the PD program Translator (a number of programs exist to read PC files, including the PC Disc Reader on the RISC User Volume 3 Special Disc). Either of these conversion utilities will convert a selection of the many commonly available microcomputer raster graphics format files into sprites for use in Paint, some of these conversions making adjustments for palette and pixel shape differences as appropriate. Hopefully, future versions of Paint will incorporate some of these facilities, both for file import and export.

## VECTOR GRAPHICS

Whereas there appears to be a myriad of formats for the storage of raster images (e.g. TIFF, GIF etc.) the situation seems to be much less confused when considering vector graphics. The solution to the problem of converting vector graphics images is to use the DXF file format wherever possible. This is due to the dominance of one product, AutoCAD, in the drawing office market. Whereas AutoCAD has its own undocumented internal file format, it also has a Data Interchange Format (DXF) specifically intended for the transfer of data between applications. By virtue of the supremacy of AutoCAD (and its junior partner AutoSketch) in the PC and minicomputer world, the DXF file format has become the

## DXF - A Data Interchange File Format

de facto lingua franca for vector graphics data transfer across a very wide range of computers.

There are a number of graphics editors available for the Archimedes which are able to import and/or export some implementation of the DXF file format. These include Autosketch itself, LinCAD, WorraCAD, Euclid, Oak's Parametric Design Tool and, of course, Draw. Other applications may also output DXF files in preference to a Draw file in order to maximise the portability of the files. Contour from !works is an example of this.

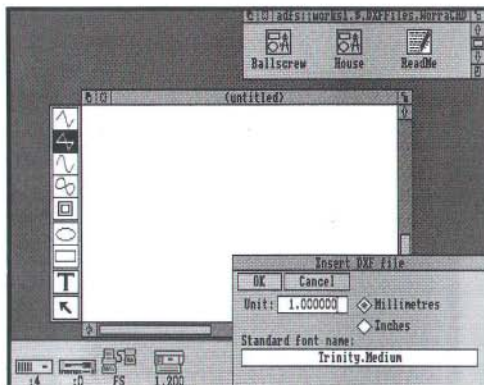
The extent to which DXF files can be handled depends very much on the application, however. For example the current implementation of Euclid will, via a utility, extrude a 2D DXF image into 3D, but will not accept 3D DXF files. As another example, the current version of Draw can handle DXF files only as input, not output, and many readers will have noticed a sizeable list of exceptions in its DXF implementation as noted in the Archimedes User Guide. Nevertheless Draw provides a very useful vehicle for converting the less ambitious DXF files into Draw format, which can then be passed on to DTP applications etc. If you have specific needs over and above this you should check with the appropriate software suppliers.

For specialist users one advantage of DXF files is that they may be read by humans, and edited or merged in Edit. They are, however, very long-winded and are read more slowly by the computer than the equivalent Draw file.

### DXF FILES IN DETAIL

DXF files contain four SECTIONS. These are known as the HEADER, TABLES, BLOCKS and ENTITIES SECTIONS. Fortunately, at a basic level, not all are required. For the moment we

need consider only the last two of these. The ENTITIES include such self-explanatory geometric primitives as LINE, POINT (not reproduced well in Draw), CIRCLE, ARC, TEXT, POLYLINE (path) and so on. BLOCKS define groups of ENTITIES which may be INSERTED into a drawing as complete objects and replicated at suitable scales as and where required. A good example of the use of DXF BLOCKS is in the Royal Institute of British Architects library of building components. DXF files may thus be used in abstracting a Bill of Quantities from an architect's drawing.



*The dialogue box displayed when a DXF file is dragged into Draw*

It is worth noting that there are differences between the primitives used in different graphics packages, and DXF primitives may not be exactly compatible with the application into which the DXF file is read. For example the Draw DXF implementation appears to require discrete linear intervals to reproduce a tight curve whereas Draw itself permits the definition of a Bezier curve. In contrast DXF has a circle primitive while Draw does not.

The following example DXF file, which contains an ENTITIES SECTION only, produces such a circle with a radius of 12.5 at x=25, y=35 if dragged into Draw. Each line must end with a linefeed (as is

## DXF - A Data Interchange File Format

normal if created with Edit), and the file must end with a carriage return or line feed and have no leading spaces. The filetype must be set to &DEA, (DXF files), and this can be done from the command line using the command *\*SetType <filename> DEA*.

```
0
SECTION
2
ENTITIES
0
CIRCLE
10
25
20
35
40
12.5
0
ENDSEC
0
EOF
```

**An example  
DXF file**

On receiving the message that a DXF file is being passed to it, Draw issues a dialogue box permitting scale and unit selection for the rendering. This month's magazine disc contains further examples of DXF files for you to experiment with.

For the very reason that the DXF format can, at a basic level, be easily transferred between applications and between machines, I have adopted the DXF format

as the standard for all 2D vector graphics produced by my own applications, and have used it extensively for the importation of data to the Archimedes from other computers. Other practical uses of DXF files included object definition for CNC machines, the display of finite element grids for stress analysis and mapping applications.

DXF is thus a widely-used format for vector graphics and is well worth further investigation. An explanation of the DXF file format is available in AutoCAD manuals, or on Iworks tools #1 (see RISC User Dec 1990 page 76), which also includes numerous example files and Basic Library procedures tested with Draw.

*This month's magazine disc contains some examples of DXF files, all of which may be imported into Draw.*

**RU**



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# Teletext for Accurate Time Keeping

*Tony Shew's short Wimp program will enable your Archimedes to keep accurate time with the help of Ground Control's teletext adaptor.*

I have been using Ground Control's Teletext Adaptor (see review in RISC User Volume 3 Issue 10) for more than three years, firstly on a Master Compact and then, with a new lead and software on my Archimedes. One application for this device, described here, is to ensure that your Archimedes keeps reasonably to the correct time of day.

It may not be obvious, but the time obtainable from your Archimedes, and displayed by such applications as Clock and Alarm (see Applications disc 2) is not as accurate as you might expect. At any time, however, the teletext adaptor can be used to obtain the correct time from the BBC's Ceefax service and to update the Archimedes' clock.

This is accomplished by the *Set\_Clock* application, described here. You will first need to create an application directory with this name (i.e. !Set\_Clock), and save within this directory suitable !Run and !Sprites files. For a sprite you may like to use the one supplied for Acorn's Clock application: if so you will need to ensure that the sprite is resaved with the name !Set\_Clock within a new sprite file called !Sprites in the !Set\_Clock directory (use Paint for this).

The !Run file can be created with Edit (create a new Obey file) containing the following lines:

```
IF "<TTX$Dir>" = "" THEN ERROR 0 Teletext
Resources not found!
RMEnsure IICttxmod RMLoad <TTX$Dir>.IICtt
xmod
Set Set_Clock$Dir <Obey$Dir>
IconSprites <Set_Clock$Dir>.!Sprites
WimpSlot -Min 32K -Max 32K
RUN <Set_Clock$Dir>.!RunImage
```

Save this in the application directory with the name !Run. Note that early versions of the Ground Control !Teletext application used a relocatable module called *Teletext*, not *IICttxmod* as shown above. You should also add the following line to the end of the !Boot file in the !Teletext directory so that all programs know where to locate Teletext Resources:

```
Set TTX$Dir <Obey$Dir>
```

Finally you will need to type in the Basic program given in listing 1 (make sure you enter Basic to do this - press F12 from within the Desktop and type Basic <Return>) and save this also within the application directory as !RunImage.

If, when run, you get the error message "Teletext Resources not found!" then the filer has not 'seen' the *Teletext* application (which supports the teletext adaptor). Putting *Set\_Clock* in the same directory as the *Teletext* application would solve the problem. Note that line 80 assumes that the *TTXutils* library file is in the !Teletext directory. The teletext module *IICttxmod* (or *Teletext* in earlier versions) should also be copied to this directory from the !System directory supplied with Ground Control's teletext adaptor. You may need to edit the !Run and !Boot files in !Teletext to reflect the new location of these modules.

## PROGRAM OUTLINE

The program is quite simple and has deliberately been kept as short as possible to ensure that the Archimedes clock is updated with the minimum delay after the information has been grabbed.

The first few lines (80 to 130) just initialise the application, assemble the

## Teletext for Accurate Time Keeping

main code (written in assembler) and tune the teletext adaptor into BBC1. The update routine is then called to update the Archimedes clock from Ceefax.

The teletext header information is grabbed twice. The first loop is repeated until the header contains real information and not the garbage it can contain when first tuned in.

The second loop repeats until the header information changes from the first loop, i.e. the time has been updated by one second. This ensures the time has just changed rather than be just about to change.

The rest of the routine transfers the time from the header and updates the Archimedes clock. After running !Set\_Clock the Archimedes clock is usually accurate to within half a second.

**Note:** The magazine disc contains a Basic version of this program which may be easier to follow but is slower in updating the Arc's clock.

```
10 REM                >!RunImage
20 REM Program      Teletext Clock Set
30 REM Version      A 1.0
40 REM Author       Tony Shew
50 REM RISC User    April 1991
60 REM Program      Subject to copyright
70 :
80 LIBRARY "<TTX$Dir>.TTXutils"
90 ON ERROR:PRINT REPORT$;" at line "
;ERL: GOTO150
100 SYS "Hourglass_On"
110 PROCAssemble
120 PROCTune("<TTX$Dir>.TTXdefault")
130 SYS "TTX_Channel",1
140 CALL update
150 SYS "Hourglass_Off"
160 END
170 :
```

```
180 DEF PROCAssemble
190 DIM code 200
200 FOR pass=0 TO 2 STEP 2
210 P%=code
220 [OPT pass
230 .update
240 MOV R5,#67F
250 ADR R0,data
260 .testloop
270 SWI "TTX_TransferHeader"
280 LDRB R3,data+39
290 AND R4,R3,R5
300 CMP R4,#ASC"0"
310 BLO testloop
320 CMP R4,#ASC"9"
330 BHI testloop
340 .getheader
350 SWI "TTX_TransferHeader"
360 LDRB R4,data+39
370 CMP R4,R3
380 BEQ getheader
390 .timeupdate
400 LDRB R0,data+32:AND R0,R0,R5
410 STRB R0,time+1
420 LDRB R0,data+33:AND R0,R0,R5
430 STRB R0,time+2
440 LDRB R0,data+35:AND R0,R0,R5
450 STRB R0,time+4
460 LDRB R0,data+36:AND R0,R0,R5
470 STRB R0,time+5
480 LDRB R0,data+38:AND R0,R0,R5
490 STRB R0,time+7
500 LDRB R0,data+39:AND R0,R0,R5
510 STRB R0,time+8
520 MOV R0,#15
530 ADR R1,time
540 SWI "OS_Word"
550 .finished
560 MOVS PC,R14
570 .data
580 EQU STRING$(40,CHR$(0)):ALIGN
590 .time
600 EQU 8:EQU "....."
610 ]
620 NEXT
630 ENDPROC
```

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# Power Building for the A3000

*David Spencer looks at the new A3000 expansion box from Wild Vision.*

To understand why the A3000 needs an external expansion box, we need to consider the differences in design between it, and the bigger Archimedes. The standard Archimedes can accept internally up to four hardware expansion cards (formerly called Podules), which comply to the standard Euro-card size of 100 by 160mm used by many systems, though not the electrical specification. Alternatively, for more complex cards a double-width card could replace two normal ones.

However, the A3000's expansion space is limited, and it was designed to support only two expansion cards - a standard Archimedes-type board plugged into the rear of the computer and contained within a metal case, and a special new-style card that fits internally. This internal card is limited in both the amount of circuitry it can hold, and the functions it can perform, when compared to its bigger brother. To expand the A3000 any further requires some form of external expansion box.

This is where the Wild Vision unit comes in. The device is housed in a very sturdy metal box, measuring 268 by 190 by 66mm, and finished in the standard Archimedes colour. It plugs into the connector at the rear of the A3000, and protrudes out to the right of the machine, avoiding all the other back-panel connectors. The box allows a total of three normal size expansion cards to be fitted, or two double-width ones, or one of each type.

In addition to providing for extra expansion cards, the expansion box also offers the missing +12V and -5V power supplies available on the Archimedes, but not the A3000. These are likely to be needed by boards such as scanners and sound samplers. The +12V is provided from an external power supply unit that comes with the expansion box, and the -5V from a voltage converter in the expansion box. Wild Vision say that the total current taken by all the expansion cards fitted should not exceed: 1A for

+5V, 400mA for +12V and 50mA for -5V. If this is a problem, Wild Vision can supply a range of larger external power supplies.



*The Wild Vision expansion box connected to the rear of an A3000*

The Expansion Box has three modes of operation, controlled by a number of push on links contained within the box. In the simplest mode, which is how the unit is supplied, only one card may be fitted, and it will appear to RISC OS as podule 0. In this mode, the expansion box really only serves as a housing for a podule and is obviously rather limited. The second mode allows three cards to be fitted, but only one may be active at any time. The active card can be switched by using a short Basic program supplied with the expansion box. Having switched cards, you must perform a hard reset (Ctrl-Break) to initialise the new card.

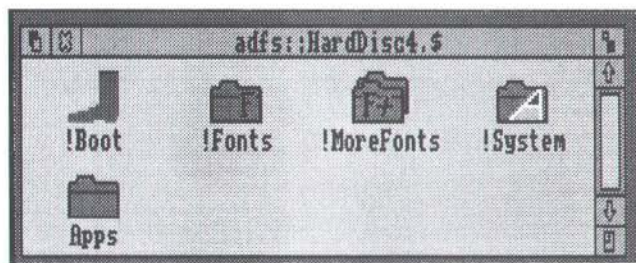
The third, and by far the most flexible, mode allows three cards to be fitted and mapped continuously into slots 0, 2 and 3 (slot 1 being the internal card). This gets as close to the Archimedes functionality as possible. However, the disadvantage of this is that it requires a small modification to be made to the A3000 itself. Wild Vision rightly point out that this must be performed by a competent Acorn service centre, and that it will in any case invalidate the warranty. They will, however, supply the necessary information on request.

# Creating a Boot Application

*Have you ever wished your Arc could set itself up and install all your favourite applications automatically every time you switch on?*

*Alan Wrigley shows you how.*

Most Arc users find that they need to perform a number of actions each time they switch on their machine. This may involve setting a font path, loading modules, installing frequently used applications like Edit etc. Creating a !Boot application enables this to be done automatically, and allows you to have a pretty icon to boot (if you'll excuse the pun).



*A directory viewer containing a !Boot application*

The Archimedes has a configuration setting called *Boot*. If this is configured, then each time the computer is switched on or reset the operating system looks for a file or an application called !Boot in the root directory of whichever disc is in the default drive (this can be either a hard disc or a floppy depending upon which drive is configured as the default). The action it then performs depends on the boot option of the disc itself. This can be set by the user with the command `*OPT 4,n`. If `n=2` then !Boot is run (or if it is an application its !Run file is run), while if `n=3` !Boot is `*EXECed`. The latter is a hangover from BBC and Arthur days and has little use in a Desktop environment.

Although a simple Obey file called !Boot (which you can create with Edit) can be used to perform some start-up operations, creating a !Boot application gives greater flexibility and also allows

you to use your imagination to design a sprite for it! If you have a hard disc, then one boot application in the root directory is all you are likely to need. If you use only floppies, then there is nothing to stop you creating a boot application for each disc. It might then be simpler to set the computer configuration to *No Boot*, and boot up each disc when required by opening a directory viewer for it and double clicking on the !Boot icon.

Whether you are using a hard disc or a floppy, first create a directory called !Boot in the root directory of the disc, and place in it a suitable sprite file if you want it to have its own sprite. Use Paint for this, and create a sprite called !boot. An example is shown

above, and you should not find it too hard to design something similar. Save the sprite file as !Sprites inside the application directory.

Next use Edit to create an Obey file called !Run. This should contain a line for each set-up operation you want to carry out. For example, to set the font path, load a printer buffer module and log on to a network, the !Run file might look like this:

```
Set Font$Path adfs::HardDisc.$.!Fonts.  
RMLoad adfs::HardDisc.$Modules.PBuffer  
Net: Logon Alan
```

You can also use !Boot to install a number of applications automatically. However, you cannot just include these in the !Run file, since only the first in the list would actually be installed. This is because the command to run the second

## Creating a Boot Application

application will not be processed until the first has been quit. To get round this, the tasks must be started in a different way. The simplest solution is to place a *Desktop* command at the end of the !Run file, which calls a second file. If we call this second file *DeskBoot*, the line would read:

```
Desktop -File <Obey$Dir>.DeskBoot
```

This method effectively uses *Wimp\_StartTask* to start up each application from the *Desktop*.

*DeskBoot* can be created as a text file using *Edit*, and should contain the list of applications you wish to run, for example:

```
Run adfs::HardDisc.$.!System
Run adfs::HardDisc.$.!BackDrop
Run adfs::HardDisc.$.!Apps.!Edit
Run adfs::HardDisc.$.!Utils.!WatchDog
```

and so on. You can also open directory viewers with lines such as:

```
FileOpenDir adfs::HardDisc.$
FileOpenDir RAM:$
```

(but the second line will generate an error if you have no RAM disc configured). Save *DeskBoot* in the !Boot application directory.

Finally, don't forget to set the boot option on the disc. Press F12 to get to the command line, then make sure the disc is the currently selected one by typing *Cat* and checking that the directory displayed belongs to the right disc. If not, type *Mount*. Then type *OPT4,2* and the boot option will be set up. Lastly, if you want the disc to boot up automatically on power-on or reset, type *Configure Boot*.

*A sample !Boot application is included on this month's magazine disc, which will install BackDrop and one or two other applications from the disc.*

RU

## Power Building for the A3000 (continued from page 19)

### THE EXPANSION BOX IN USE

The documentation supplied with the expansion box is rather terse (four sides of A4), but is sufficient, covering basic principles, modes of operation and installation of expansion cards.



*The expansion box seen from the rear, with one full-width and two half-width cards installed*

The only real problem you might encounter stems from the fact that the box protrudes to the right of the A3000. It will

fit quite happily under an Acorn-type monitor stand, but cannot be used with some other types, which have solid sides. Once fitted, though, you can largely ignore the expansion box, especially if you have made the modifications to let it work Archimedes-style.

### CONCLUSION

Expanding the A3000 was never going to be easy, but I feel that Wild Vision have done about the best job possible, and at a reasonable price. My only real gripe is that the box is not physically screwed to the A3000, which could cause problems if the computer was moved. I would however advise any purchasers to weigh up the pros and cons of modifying their A3000 to get the best out of the expansion box. Personally, I would perform the modification.

|                 |                                                                                                                          |
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### Software

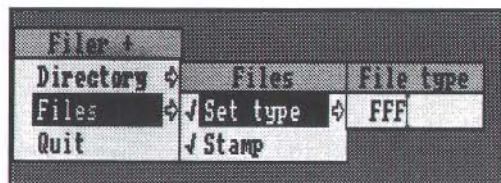
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# Added Filing Functions with FilerPlus

Andrew Benson describes an application to augment the features of the RISC OS Filer.

The application described and listed here supplements the facilities provided by the RISC OS Filer when dealing with files displayed in a directory viewer. It allows you to date stamp a file (with the current time and date), to set the file type of files as required, and more generally to set the CSD (the currently selected directory) from the Desktop. It also allows you to open Filer windows for the Printer and Serial ports.



FilerPlus menu structure

To implement the application on your Archimedes you will need first to create an application directory called *!Filer+*. Within this you will need to save three files, *!Run*, *!RunImage* and *!Sprites*. The *!Run* file should be created with Edit using the *Create Obey* file option. When the Edit window appears, type in the following lines and save to *!Filer+* with the name *!Run*:

```
Set Filer+$Dir <Obey$Dir>
WimpSlot -min 16k -max 16k
Run <Filer+$Dir>.!RunImage
```

*!RunImage* is the Basic program given in listing 1. Enter Basic by pressing F12 and typing Basic <Return>. Then enter the listing as printed. Save the program in *!Filer+* as *!RunImage*.

The *!Sprites* file should contain a sprite (also called *Filer+*) to represent *Filer+* in a directory viewer and on the icon bar. This is essential if the application is to appear on the icon bar, RISC OS will use a default icon if

necessary to represent the application in a directory viewer (see the Application Shell Generator in RISC User Volume 3 Issue 2, and a version on the Volume 3 Special Disc).

## USING FILERPLUS

With everything now ready, double-click on *Filer+* to install it on the icon bar (to the left-hand side). Clicking the menu button over the icon will reveal a three option menu. The *Directory* option allows a viewer for either the serial port or the printer stream (i.e. whatever is the currently configured printer - serial, parallel, or network) to be opened. Dragging a suitable file into the appropriate viewer will cause the bytes in that file to be sent through the corresponding port without further ado. This avoids any need for additional software, or leaving the Desktop, for this purpose.

The *Files* submenu has two options, *Set type* which can be set to the appropriate filetype by entering its hex code, and *Stamp* which date stamps files. Either (or both) of these options may be selected by clicking, and the selected option will appear ticked in the *Files* submenu. To date stamp a file, or to set its type, simply drag a file from its directory viewer to the *Filer+* icon. The choice of function (or functions) is determined by the previously described setting.

Finally, if a directory, or application directory, is dragged onto the *Filer+* icon, then that becomes the currently selected directory.

```
10 REM >!RunImage
20 REM Program Filer Plus
30 REM Version A1.00
40 REM Author Andrew Benson
50 REM RISC User April 1991
60 REM Program Subject to Copyright
```

## Added Filing Functions with FilerPlus

```

70 :
80 DIM bk% 512:DIM menu% 180:DIM text
2% &100
90 DIM temp% 64,subdir% 100,subfile%
100,subtype% 100
100 DIM buffer% 31
110 :
120 PROCInitialise
130 PROCCreate_Menus
140 PROCIconbar
150 :
160 ON ERROR PROCError
170 REPEAT
180 SYS "Wimp_Poll",1,bk% TO eventCode%
190 CASE eventCode% OF
200 WHEN 6:IF bk%!8=2 AND bk%!12=-2 SY
S "Wimp_CreateMenu",,menu%,!bk%-64,228
210 WHEN 9:PROCMenu_Selection
220 WHEN 17,18:PROCreceive
230 ENDCASE
240 UNTIL finished%
250 SYS "Wimp_CloseDown"
260 END
270 :
280 DEF PROCInitialise
290 SYS "Wimp_Initialise",200,&4B53415
4,"Filer +"
300 finished%=FALSE
310 $buffer%="FFF"+CHR$0
320 stamp%=0:set%=0
330 ENDPROC
340 :
350 DEF PROCIconbar
360 $(buffer%+15)="Filer+"
370 $(buffer%+22)="S!Filer+"
380 bk%!0=-2:bk%!4=0
390 bk%!8=-16:bk%!12=148
400 bk%!16=84
410 bk%!20=&1700010B
420 bk%!24=buffer%+15
430 bk%!28=buffer%+22
440 bk%!32=7
450 SYS "Wimp_CreateIcon",,bk% TO bar_
handle%
460 ENDPROC
470 :
480 DEF PROCCreate_Menus
490 $subdir%="Directory"
500 subdir%!12=&70207
510 subdir%!16=130:subdir%!20=44
520 subdir%!24=0
530 subdir%!28=0:subdir%!32=-1
540 subdir%!36=&7009011
550 $(subdir%+40)="Printer"
560 subdir%!52=&80:subdir%!56=-1
570 subdir%!60=&7009011
580 $(subdir%+64)="Serial"
590 $subfile%="Files"
600 subfile%!12=&70207:subfile%!16=170
610 subfile%!20=44:subfile%!24=0
620 subfile%!28=0:subfile%!32=subtype%
630 subfile%!36=&7009011:$(subfile%+40
)="Set type"
640 subfile%!52=&80:subfile%!56=-1
650 subfile%!60=&7009011:$(subfile%+64
)="Stamp"
660 $subtype%="File type"
670 subtype%!12=&70207:subtype%!16=130
680 subtype%!20=44:subtype%!24=0
690 subtype%!28=&84:subtype%!32=-1
700 subtype%!36=&7009111
710 $(buffer%+4)="A0-9A-Fa-f"
720 subtype%!40=buffer%
730 subtype%!44=buffer%+4
740 subtype%!48=4
750 $menu%="Filer +"
760 menu%!12=&70207:menu%!16=170
770 menu%!20=44:menu%!24=0
780 menu%!28=0:menu%!32=subdir%
790 menu%!36=&7009011
800 $(menu%+40)="Directory"
810 menu%!52=0:menu%!56=subfile%
820 menu%!60=&7009011
830 $(menu%+64)="Files"
840 menu%!76=&80:menu%!80=-1
850 menu%!84=&7009011
860 $(menu%+88)="Quit"
870 ENDPROC
880 :
890 DEF PROCMenu_Selection
900 LOCAL buttons%
910 SYS "Wimp_GetPointerInfo",,temp%
920 buttons%=temp%!8
930 CASE !bk% OF
940 WHEN 0:PROCdirs
950 WHEN 1:PROCfiles
960 WHEN 2:finished%=TRUE
970 ENDCASE
980 IF buttons%=1 SYS "Wimp_CreateMenu
",,menu%,!bk%-64,228
990 ENDPROC
1000 :
1010 DEF PROCreceive
1020 CASE bk%!16 OF
1030 WHEN 0:finished%=TRUE
1040 WHEN 3:PROCset_chng

```

## Added Filing Functions with FilerPlus

```
1050 ENDCASE
1060 ENDPROC
1070 :
1080 DEF PROCdirs
1090 IF bk%!4=0 THEN OSCLI("Filer_OpenD
ir Printer:")
1100 IF bk%!4=1 THEN OSCLI("Filer_OpenD
ir Serial:")
1110 ENDPROC
1120 :
1130 DEF PROCfiles
1140 CASE bk%!4 OF
1150 WHEN 0:
1160 CASE bk%!8 OF
1170 WHEN -1:set%=set% EOR 1
1180 WHEN 0:set%=1
1190 ENDCASE
1200 WHEN 1:stamp%=stamp% EOR 1
1210 ENDCASE
1220 subfile%!28=set%
1230 subfile%!52=stamp%+&80
1240 ENDPROC
1250 :
1260 DEF PROCset_chng
1270 LOCAL text%,a%,type%

1280 text%=bk%+44
1290 a%=text%-1
1300 REPEAT
1310 a%+=1
1320 UNTIL ?a%=0
1330 ?a%=13
1340 type%=bk%!40
1350 CASE type% OF
1360 WHEN &1000,&2000:OSCLI("Dir "+$te
xt%)
1370 OTHERWISE
1380 IF set% THEN OSCLI("SetType "+$te
xt%+" "+$buffer%)
1390 IF stamp% THEN OSCLI("Stamp "+$te
xt%)
1400 ENDCASE
1410 ENDPROC
1420 :
1430 DEF PROCError
1440 bk%!0=ERR
1450 $(bk%+4)=REPORT$+" (error code "+S
TR$(ERR)+") "+CHR$(0)
1460 SYS "Wimp_ReportError",bk%,1,"File
r +"
1470 ENDPROC
```

**RU**

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# Archimedes Software



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## Disc 23 - Desktop Applications

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# Archway 2

*Crosbie Fitch investigates Simtron's Wimp program development tool.*

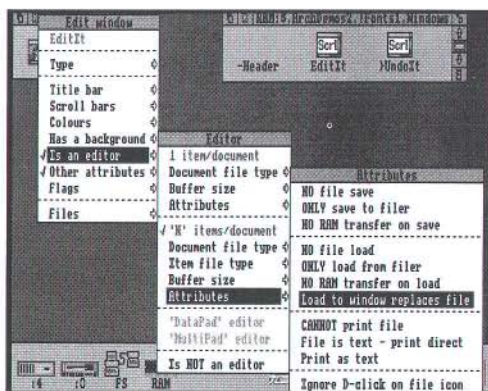
**A**rchway is one of those facilities you get in abundance on other machines like the PC that are meant to make writing applications an absolute doddle. At least, they're supposed to eliminate what is usually a very large part of any software project: writing the user interface. In the case of Archway, this means a package which helps you design an entire Wimp program structure, including windows, icons, menus and the actions which are taken when these are accessed, without the hard, tedious programming that's otherwise required to make it all happen. Of course, "real programmers do it all themselves" some might say, but I'm not so sure it's a matter of competence. Where time and other resources are in short supply, it often makes sense to take advantage of something that makes software development easier and quicker.

## THE PACKAGE

With four discs, Archway is not a small package, though a lot of the disc space is taken up by demonstrations and examples. At 318 pages the manual's not on the short side either, though it's a much easier read than the 1,330 pages of the Programmers Reference Manual. There's a registration card and a couple of upgrade vouchers, which I suppose might reassure users that Archway will be well supported in the future. The package is due for upgrade in April in any case.

## WHO IS ARCHWAY FOR?

If you're writing an application whose user interface can consist entirely of windows, menus and icons then there is little doubt that Archway could be useful to you. Facilities are provided for Archway-generated programs to display quite a wide variety of standard outputs: text/sprite icons, text files, sprite files, Draw files, Euclid 3D files and Ace film files.



*Archway's comprehensive window editing facilities in action*

On the other hand, if you were hoping Archway would be just the thing to help you write a word processor, art package, CAD/CAM utility or arcade game, you may need to look more closely at what it has to offer, since extensive editing facilities for interactive windows (as used by Draw or Edit for example) are not provided. You can get complicated if not dynamic displays within Archway windows fairly easily, but the techniques for doing so are rather primitive. A window's 'non-standard' contents can be generated by a function in your program, but Archway updates the window either by recalling the function, which may be slow, or by using a suitably sized sprite as intermediary, which can take up a lot of memory in high resolution modes.

The problem seems to be that in trying to make most things easy, Archway makes complicated things inefficient, if not more complicated. Archway programs are one level removed from that otherwise intimate relationship with the window manager, where programs are able to efficiently figure out how to refresh parts of windows that need updating or have been obscured.

So Archway isn't the best solution for every programming problem, but I don't

think it needs to be. Almost by definition, most people requiring Archway's facilities will not want the sophistication and freedom of a compiled language. Efficiency notwithstanding, Archway is ideal as a prototyping platform. The closest you can get to it at the moment is to use FormEd in conjunction with the RISC OS C library. If your needs and capabilities are modest then I'd suggest Archway will suffice admirably - I'm sure it will take a long time to outgrow its possibilities. Even for more complex projects, it could still be very useful in the early, prototyping stages of development.

### USING ARCHWAY

Archway basically consists of a suite of editing tools, which can be accessed by a key application called ArchTools. This sits on the icon bar and can be used to edit an Archway application (if dragged onto it) or create a new one (via the menu). Each editing tool is a separate application and as such can be invoked separately, but is otherwise conveniently selected from the icon bar menu.

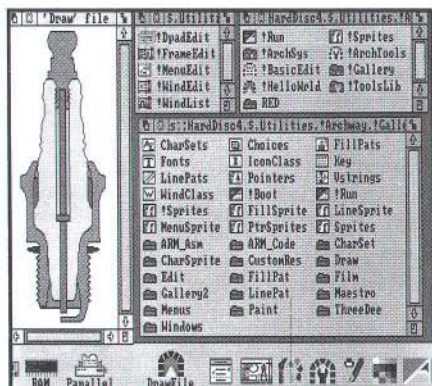
Archway applications usually start off as what are called application shells. These are proper, working, multi-tasking RISC OS programs that already contain the bare essentials required for a particular type of application. The various shells are listed in table 1.

| SHELL NAME | TYPE OF APPLICATION      |
|------------|--------------------------|
| Shell      | General purpose          |
| GrafShell  | Graphics                 |
| EditorA    | Editor with 1 item/file  |
| EditorB    | Editor with n items/file |
| DataPad    | Database orientated      |
| Custom     | Advanced                 |

**Table 1: Archway application shell types**

All the resources required by an Archway application are contained in the application directory as usual. Apart from the !Boot, !Run, !Sprites, and !RunImage files though, all the others are Archway specific. Instead of a Templates file you have a Windows file, and others called Menus and Choices.

The !RunImage program must be written in Basic, and your preferred editor is automatically invoked for this purpose (either ArmBE or Edit). If you don't like Basic, there are facilities for incorporating machine code routines. Not much support is apparent for interfacing with compiled code, but by using the "LINK -relocatable" option, I suppose it's possible - if you can figure out the parameter passing complexities.



**Some of the huge range of resources on the Archway discs, together with a demo showing the ability to display a Draw file within a window**

The Archway system firmly encourages a certain format for the !RunImage program. It is divided up into segments each of which has to be preceded by a signature and segment title, as in the following example:

```
---\---\---(BUTTON FUNCTIONS)
DEFFNmainW
```

Key functions have to have special names, and each program has to have certain information in specific arrays. Most of this is sorted out by the application shell of course, making the programmer's task virtually just a matter of filling in the gaps.

### EDITING WIMP STRUCTURES

There are exhaustive window and menu editing facilities; everything can be designed interactively requiring only that you write the functions that should be called when the user performs a certain action on a window or menu. You have full

access to all the RISC OS features, and can create menus and design windows as sophisticated as you get in commercial RISC OS applications.

Windows are designed by specifying the positions of icons of any type anywhere within a window, and specifying what particular actions, if any, should occur when the user does something to them. You can also position 'frames' within windows. These define particular areas whose contents rely on a file or Basic graphics function. Menus are designed by specifying each option in terms of how it should appear and what it should do. Actions initiated by icons or menu options can do many things that are predefined by Archway (even play tunes). In addition to calling functions, opening windows or other menus, they can open particular types of tool windows. These are concerned with the programming extensions Archway provides, such as 'GrafScan' or 'DataScan' windows used to navigate around a graphics display or a database.

There are tools for almost everything: designing window background fill patterns, 8x8 BBC type fonts, defining mouse pointers, function and hot keys, anti-aliased fonts, and so on.

Bugs are always of concern to all programmers, so I'm sure you'll be pleased to know that Archway provides various facilities to help track them down. There are break-point and beep functions, both of which can be controlled by a debugging mode option on the ArchTools icon bar menu. With debugging mode on, when programs terminate you can investigate the values of Basic variables.

There is a lot to Archway and it is by no means something you can use instantly. To help you get to grips with the package there are many demonstration programs and tutorials, both in the manual and on the discs (not necessarily the same ones). Don't think Archway will design your program for you - it won't. There is still much work to be done, and a lot of it will be in learning how to get Archway to produce what you want.

## HOW WELL DOES IT WORK?

Archway 2 appears to have been put together well, and is perfectly at home on the Desktop where it multi-tasks correctly. Nearly all of the facilities are written in Basic, though this appears to have been 'crunched'. There is much evidence, both from hints in the manual and from empty libraries and directories, that the package is scheduled for further enhancement.

In such a staggeringly large package as Archway I don't doubt there will be some bugs. However, in playing around with the package I found it remarkably bug free, though I did come across a few glitches. Sometimes when a floppy disc needs to be inserted the drive emits quite a racket, probably due to repeated checks for the disc. Some of the demos were lacking in the idiot proofing department, though understandably this isn't critical. The Archway module doesn't appear to mind being RMKilled, and presumably because the other Archway programs are unaware of this, the system can behave most strangely.

## CONCLUSION

Overall I'm extremely impressed with Archway 2. It's a very ambitious product and one that now provides the many budding Archimedes developers with a facility that will enable them to get their ideas off the drawing board before they evaporate. With future enhancements likely to include support for communications, hypertext, networking, CD ROM and interactive video, it doesn't appear that Archway will stop here. It looks as though we may soon see a lot more Wimp-based software appearing as a result of this product.

**Note:** Programs written with Archway 2 can be sold without any licence fees. This is except for the use of the EuclidG module which requires separate permission from Ace computing.

**Product  
Supplier**

**Archway 2  
Simtron  
4 Clarence Drive,  
East Grinstead RH19 4RZ.  
£99.95 inc. VAT**

**Price**

**RU**

# BackDrop

***This application by Glynn Clements is probably the most versatile implementation of the sticky backdrop concept yet produced for the Arc.***

*The program is supplied on this month's magazine disc only.*

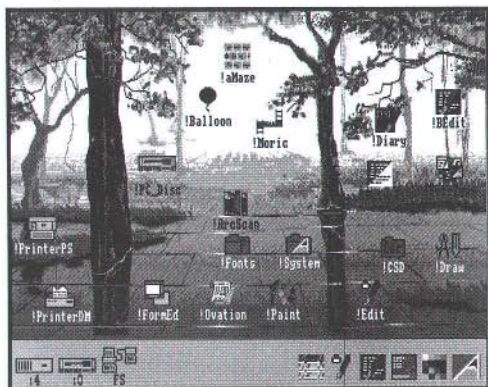
The RISC User magazine disc for Volume 3 Issue 5 included a public domain program called *StickyBD*, which allowed you to stick file and directory icons onto the Desktop, with a background picture if required. Our new *BackDrop* application, which is in constant use here in the RISC User offices, takes the concept much further, and turns the Desktop into a very flexible and versatile workbench.

A sticky backdrop allows you to "stick" icons to the Desktop background by dragging them from a directory viewer to the required position. From here, they can be accessed directly, irrespective of whether the viewer remains open. So, for example, if you stick several of your favourite applications to the Desktop by dragging the application directory icons onto the background, you can then install them at any time just by double-clicking on the icon visible on the background. Furthermore, when you have stuck down all the icons you need, you can save the background state, so that next time you run *BackDrop*, the same icons reappear automatically on the background.

At the same time, it is possible to display a picture as a backdrop instead of the standard mid-grey background. In the case of *BackDrop*, all you need do is create a file called *Sprites* inside the *!BackDrop* directory, and the first sprite in that file will automatically be displayed when *BackDrop* is run (you cannot use a 256-colour sprite in a 16-colour mode, however). Icons can be stuck to this picture just as with the normal background. The application supplied on the monthly disc comes complete with a background picture.

Where *BackDrop* differs from other such programs is in the degree of control you have over individual icons. Each icon may have its own text and background colours: if for example you are using a

background sprite containing areas of different colour, you can match the background colour of each icon to the colour of the area where it is positioned, and alter the text colour to make it stand out. Icons may also be individually set to large or small, so you could, for example, give all your most frequently used applications large icons for easier access, with a cluster of small icons for files which you do not need to use so often.



***BackDrop in operation.***  
***The background picture was created with Artisan 2 and is reproduced courtesy of Clares***

*BackDrop* also allows you to set defaults for icon size and colours, so that all icons stuck to the background in future will adopt the default settings. Another feature which sets *BackDrop* apart is that it fills the screen in whichever mode it is started up; so if you are using, say, mode 16 you can use the full width of the screen as a sticky backdrop. However, a backdrop started in one mode will not be the correct size if you change to a mode with a different screen size. In practice this is of little importance since most users tend to have one favourite screen size and keep to it.

Finally, a number of filing system operations can be performed on items directly from the *BackDrop* menu. This allows you to unlock, count or display information on an item, or to catalogue it or set the CSD if it is a directory. **RU**

# A SWI Name Finder

by Arnold Bagshott

Two short utilities are listed here. The first prompts for a SWI number (precede this with '&' if you are supplying it in hex), and returns the corresponding SWI name. To make use of the program, type in listing 1, and save it. You can

run it either from Basic, or directly from the Desktop. In the latter case, just double-click on the program's icon in its directory viewer, then enter the SWI number of your choice. For example, if you enter:

&400C0

you will see the following display:

Wimp\_Initialise 400C0

To quit the program, just press Escape. Note that in order to keep the program short, bells and whistles have not been included, and if you enter anything which does not evaluate to a numeric expression, the program will terminate.

The second program generates a scrolling display of all the SWI calls known to your machine at the time of running. This will include those from both resident modules and those loaded from disc, but will exclude those which have been \*UNPLUGged or \*RMKILLED.

This program is very useful for 'browsing' through the SWI calls provided by the various modules. In the majority of cases the name of the call gives a very good indication of its function (though not of course what parameters to call it with).

If you run the program by clicking on its icon in a directory viewer, you will see the results scroll past in a task window. To slow down the rate of scroll, hold down

Ctrl, or to freeze the output, press Ctrl-Shift. To quit, press Escape.

|                       |       |
|-----------------------|-------|
| Wimp_GetWindowState   | 400CB |
| Wimp_GetWindowInfo    | 400CC |
| Wimp_SetIconState     | 400CD |
| Wimp_GetIconState     | 400CE |
| Wimp_GetPointerInfo   | 400CF |
| Wimp_DragBox          | 400D0 |
| Wimp_ForceRedraw      | 400D1 |
| Wimp_SetCaretPosition | 400D2 |
| Wimp_GetCaretPosition | 400D3 |

*Output from the scrolling display of SWI names*

## Listing 1

```
10 REM >WhatSWI1
20 DIM block 256
30 REPEAT
40   INPUT "SWI no (if hex, precede w
ith '&') ? "I$
50   I%=EVAL(I$)
60   SYS "OS_SWINumberToString",I%,bl
ock,256
70   J%=0
80   REPEAT J%+=1:UNTIL block?J%=0
90   block?J%=13:PRINT $block;
100 SYS &39+(1<<17), 0, block TO A%
110 IF A%<&03800000 THEN PRINT TAB(40)
~A% ELSE PRINT
120 UNTIL FALSE
```

## Listing 2

```
10 REM >ShowSWIs1
20 DIM block 256
30 I%=0
40 REPEAT
50   SYS "OS_SWINumberToString",I%,bl
ock,256
60   J%=0
70   REPEAT J%+=1:UNTIL block?J%=0
80   block?J%=13
90   IF $block="User" OR $block="XUse
r" THEN I%+=64:UNTIL I%>&FFFFFF:END
100   PRINT $block;
110   SYS &39+(1<<17), 0, block TO A%
120   IF A%<&03800000 THEN PRINT TAB(4
0)~A% ELSE PRINT
130   I%+=1
140 UNTIL FALSE
```

**RU**

# TECHSOFT

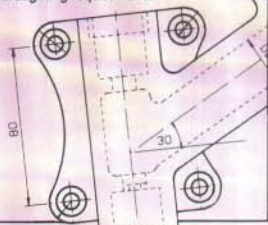
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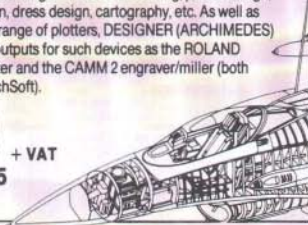
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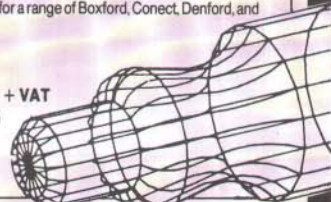


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# Control on the Archimedes

Lee Calcraft reviews Joe Telford's latest book

This new book published by HCCS at just £9.95 is about using analogue and user ports on the A3000 computer, as implemented by one of the growing number of user port expansion cards available for this machine. As such, its title *Control on the Archimedes* is just a little misleading - though almost all of the book's content applies equally to an Archimedes with an appropriate expansion card. The reason for the emphasis on the A3000 is that a major aim of this book is to fill a gap in the education market. While there are ample texts on interfacing the BBC micro, there is little or nothing for the A3000, which is becoming a major player in the education field.

The book is well planned with a good index and sensible contents list; and is easy to dive into if you are seeking information on a particular aspect of interfacing. On the other hand you can read it from cover to cover, as it introduces the concept of interfacing, shows how to use different kinds of sensors, and develops simple circuits for detecting inputs of one kind or another. Control of motors, relays and signals is treated, as is the use of thermistors, photocells and variable resistors with the analogue port. There are also a number of useful appendices, including one giving the addresses of hardware suppliers.

Each section has a good number of clearly presented programs - for example, there is a simple burglar alarm system using proximity sensors on windows and

doors. The programs are all very short, which is ideal for getting quick results from a particular set up; but I would have liked to see some more ambitious software in perhaps one or two cases, just to whet the appetite a little.

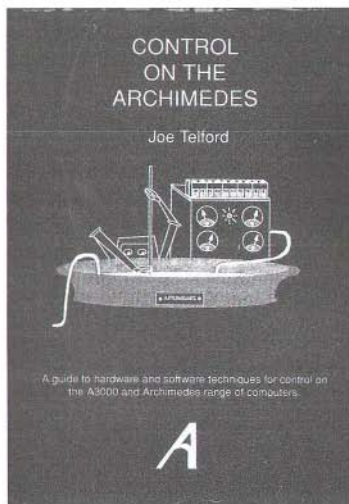
The circuits are generally simple - ideal for schools - with clearly labelled components, and with the names of suppliers given in the appendix. For consistency and clarity I would have preferred all circuits to read from left to right (rather than at random), and I am unhappy about the practice of not using pull-up resistors on any of the digital inputs to the parallel port. This relies on leakage current to take inputs high by default, and is not good practice. I would also have liked to see attempts at making precise measurements using, for example, semiconductor sensors rather than (or in addition to) thermistors for temperature measurement.

As to the software, much of it would not run at all on an A3000 (or Archimedes for that matter). There are two problems. First of all most calls to SYS "OS\_Byte" are incorrect, and lack a vital comma after the endquote. Thus for example, line 100 on page 32 reads:

```
100 SYS " OS_Byte" &96,&60,TO,,userport
but should read:
```

```
100 SYS "OS_Byte",&96,&60 TO,,userport
```

In this and a number of cases there is an additional error: the space introduced after the first quote in " OS\_Byte", which will result in "SWI name not known" errors.



# B\_to\_T Revisited

Alan Wrigley presents a short update to RISC User's Basic-to-text conversion utility.

David Spencer's *B\_to\_T* was published in RISC User Volume 2 Issue 8 and has proved a very useful utility. It offers a fast and easy way to convert Basic programs to text files and vice versa, all from the Desktop. This enables you to edit your Basic programs without leaving the multi-tasking Desktop environment. However, the original program does suffer from one drawback, namely that any top-bit-set characters which are inside quotation marks or which follow REM statements are interpreted as Basic keyword tokens, and thus de-tokenised when converting to text.

It is useful to be able to include characters from the expanded set within PRINT or REM statements; for example, you might want to display foreign characters on the screen, or use the arrow symbols. The modifications listed here will enable *B\_to\_T* to handle these situations correctly by inserting the actual characters into the text file instead of de-tokenised keywords. As an added bonus, the application will report any lines it meets which contain unmatched quotes.

## LINE NUMBERS

At the same time, the opportunity has been taken to add an option to strip off Basic line numbers when converting to text. This is a useful option, as it is often much easier to work without line numbers when using a text editor to edit a program (line numbers have no meaning at all in a text file). An extra item has been added to the icon bar menu, namely *Line nos*, which can be toggled on or off. By default, this item will be ticked, and line numbers will then be included in the text file. If switched off, line numbers will be removed, unless the program contains any GOTO or RESTORE statements. In this case an error will be generated, since the numbers following these statements would no longer have any meaning once the lines are un-numbered.

The conversion of un-numbered text files back into numbered Basic programs

is already performed automatically by the original *B\_to\_T*, so no further modification is necessary to do this.

## PROGRAM DETAILS

To trap top-bit set characters inside quotes, a flag is toggled on and off each time a quotation mark character (ASCII 34) is encountered. When the flag is off, keywords are de-tokenised as normal, but when it is on, any characters above 128 are assumed to be within a quoted string. The flag is reset at the start of each line, and if it is found to be on at the end of the line, this means that the line contains unmatched quotes, and a warning is issued.

When converting from Basic to text, a variable *strip* holds the current state of the line-stripping option. When it is on, any program dragged to *B\_to\_T* will be scanned for GOTOs or RESTOREs (ASCII code &8D), and an error message is displayed if any are found. If none is found, then the program is converted as normal, except that line numbers are simply ignored.

To get the new version of *B\_to\_T* up and running, load the original program *BConvert* as listed in Vol.2 Iss.8 (not the version on that month's magazine disc), and type in the lines listed here. Some are new lines, others replace existing lines. Save the finished program as *BConvert* again, and it can now be used in place of the old one.

*The complete updated B\_to\_T is included on this month's magazine disc.*

```
41 REM          mods by Alan Wrigley
50 REM RISC User April 1991
81 DIM baserrblk 80
180 $valid="a- ":strip=0
320 WHEN 9:PROCselect(block)
830 menu!20=40:menu!24=0:menu!28=1-strip
ip
850 $(menu+40)="Line nos"
851 menu!52=&80:menu!56=-1:menu!60=&70
00021
852 $(menu+64)="Quit"
```

```
860 SYS "Wimp_CreateMenu",,menu,!b-64,
176
871 :
872 DEF PROCselect(b)
873 SYS "Wimp_GetPointerInfo",,b+16
874 CASE !b OF
875 WHEN 0:strip=strip EOR 1:!flag=stri
ip
876 IF b!24=1 THEN PROCmenu(b)
877 WHEN 1:quit=TRUE
878 ENDCASE
879 ENDPROC
1860 SYS "OS_File",&FF,&ff,&bst+s% TO ,,
,,length
1861 goto=0:IF totext THEN
1862 FOR i%=&bst+s% TO &bst+s%+length
1863 IF ?i%=&8D THEN goto=1
1864 NEXT
1865 ENDIF
1866 IF goto AND strip THEN
1867 !baserrblk=1:$(baserrblk+4)="Line
numbers cannot be stripped (program cont
ains GOTO/RESTORE)"+CHR$0
1868 SYS "Wimp_ReportError",baserrblk,1
,"Basic<>Text"
1869 ELSE
1881 ENDIF
2250 $fname=fm$+fn$+fp$
2270 SYS "Wimp_GetPointerInfo",,oldblk
```

```
2280 SYS "Wimp_CreateMenu",,file,!oldbl
k-64,320
2530 DIM code 1024
2570 .1 ADR R0,flag:LDR R8,[R0]:LDRB R1
,[R3,#1]
2601 MOV R5,R0:ADD R3,R3,#3
2602 TST R8,#1
2610 MOVEQ R1,R4:MOVEQ R2,#6
2620 SWIEQ "OS_ConvertCardinal2"
2630 MOVEQ R4,R1:.11 LDRB R0,[R3],#1
2650 BEQ ln:CMP R0,#34
2651 EOREQ R8,R8,#2:CMP R0,#67F
2661 TST R8,#6:STRNEB R0,[R4],#1:BNE 11
2662 CMP R0,#244:ORREQ R8,R8,#4
2701 TST R8,#2:BEQ 1
2702 MOV R0,R5:ADR R1,erl:MOV R2,#6
2703 SWI "OS_ConvertCardinal2"
2704 ADR R0,errblk:ADR R2,appname
2705 MOV R1,#1:SWI "Wimp_ReportError"
3060 .llim EQU D &FEFF
3061 .flag EQU D 0
3062 :
3063 .appname EQU "B_to_T":EQU B 0
3064 ALIGN
3065 .errblk EQU D 255
3066 EQU "Unmatched quote at line "
3067 .erl EQU D 0:EQU D 0
3068 JNEXT
```

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## Control on the Archimedes (continued from page 33)

Many programs in this book use SYS "OS\_Byte" (or worse SYS "OS\_Byte"), and most references lack the comma. I counted 21 in the first 40 pages. I imagine that all the programs in this book have been thoroughly checked, and must conclude that these errors arose from global replacements made at some stage. Other errors have apparently been introduced at the production stage. A number of spaces have been introduced which will again mean that programs will not work. For example, the program referred to above contains references to five different procedures in the form:

```
PROC door
DEF PROC door
```

The space after "PROC" ensures that a "Bad call" error will be given for each and every one. There is also at least one case of

a variable name containing a space - the variable "user port" on page 8.

This is all somewhat unfortunate. However, as a result of conversations with the publisher, a note on the errors will I understand go out with each copy of the book, so resolving the problem. In any event, I am sure that Joe Telford's book will find great favour with teachers, and that the experiments described within will be popular with pupils in the context of the IT curriculum.

*Control on the Archimedes is available from:*  
**HCCS Associates Ltd.**  
**575-583 Durham Road,**  
**Engine Lane,**  
**Low Fell,**  
**Tyne and Wear NE9 5JJ.**  
**Tel. 091-487 0760**

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## A round-up of the latest games for the Archimedes and A3000 by Peter Rochford.

**I**t is always good news when another software house decides to dip its toe into the waters of the Arc games world and try out one or two releases. Cygnus Software has taken this bold step with two games licensed from the French software house, UBI Soft. These have appeared on the Amiga in the past and are conversions that share the same superlative graphics and sound.

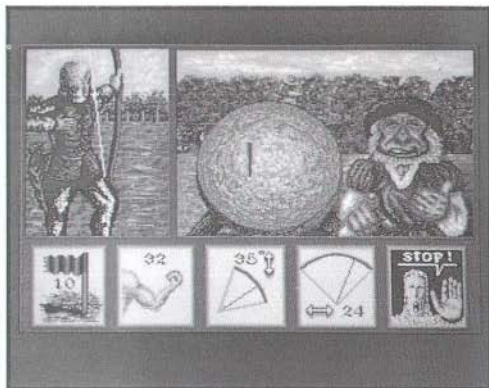
*Iron Lord* (£19.00) from Cygnus is an adventure game that features text and graphics coupled with a certain amount of animation. The game is set in mediaeval times, and you are the just knight set the task of liberating your homeland from the rule of your evil uncle.

The game opens with a view of your lands, and scattered around are various villages which surround the castle from which you set off on your quest. To move to a new location, you simply click the mouse pointer over your destination to which you then ride on horseback, all depicted graphically on screen.

On arrival at your destination, you are given an aerial view of the village. With the aid of the mouse you can walk around visiting the various buildings (which can be entered and explored) and pass the time of day with their inhabitants. At certain points you are invited to participate in such local events as an archery contest, and an arm wrestling bout, while a gambling session may also tempt you from your path.

All these tasks must be undertaken with success in order to make progress, as by winning these you hope to gain the

support of the people to help raise an army to win back your lands. The task is not easy and just to make it that much harder, potential assassins will occasionally pounce on you.



*Iron Lord from Cygnus Software*

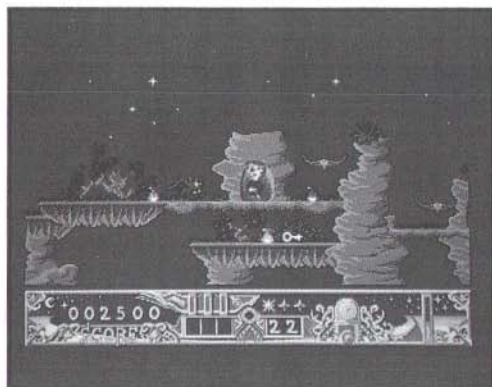
The graphics in this game really are excellent, and there is a catchy and most enjoyable music soundtrack. Both are suitably mediaeval in style, and help to set the scene.

Playing the game is simplicity itself with all control via the mouse. Having said that, achieving anything is not such a simple matter. Mastering the art of archery, for example, can take a great deal of practice, but nonetheless is great fun. In *Iron Lord* you will need to think out and plan your moves very carefully, and there are plenty of puzzles to solve which will both occupy and frustrate you.

I fell overboard for this game the moment I first clapped eyes on it. It is of a quality that the Arc truly deserves, and is a first class conversion from the Amiga original. Very highly recommended.

The second Cygnus release is *Twin World* (£19.00), yet another conversion from the Amiga and every bit as good as *Iron Lord*.

*Twin World* is an arcade style adventure with a story line that goes like this. You take the part of Elopa whose father's lands have been seized by the wicked Maldur. Your task is to find Maldur and defeat him, but on your way you must find and recover the 23 pieces of a sacred amulet that have been scattered throughout the land.



*Twin World, also from Cygnus*

You must guide Elopa through 23 levels of this adventure looking for the elusive pieces of the amulet. As you would no doubt expect, you are far from alone, and *Twin World* features a host of nasties that are constantly on the prowl to thwart your efforts. They fly at you, jump on you, drop on you and materialise at just about every twist and turn.

The name *Twin World* derives from the fact that the game is played on two levels. Each scene shows a world above ground and a corresponding scene below ground. You transfer from one to the other by passing through cave openings or doors on each level.

Whilst on your travels, you are armed with three different kinds of bubbles that you lob at your adversaries. They all have varying strengths and behave differently when launched. You replenish your supply of these by collecting an assortment of articles which are left behind after you destroy one of the beasties you encounter.

After completing each level you can save your position for recall later, and after five levels, you are set a special level with a time limit to enable you to collect extra lives and bubbles.

The graphics in *Twin World* are outstanding to say the least. There is a smooth scrolling detailed backdrop with characters beautifully designed and animated in such a way that the whole game takes on a cartoon-like appearance. Music is excellent as are sound effects. Both have the option to be switched off if desired.

There is only one word to describe this game - compulsive. Once started you just cannot leave it alone. The early levels are relatively easy, and the rate at which difficulty increases with each level has been well balanced. The whole game has been brilliantly thought out with puzzles that frustrate rather than irritate. Some are so downright devious to solve that you sometimes stop and wonder what kind of mind the designer of this game had!

Overall, *Twin World* is a masterpiece of game design and programming. There is not one other game on the Arc at the moment I can think of that has the level of appeal and addictiveness that *Twin World* has. Excuse the gushing enthusiasm but I hope that this will encourage you to buy it. If you do, you will not be disappointed and at the same time,

*Continued on page 40*

## New Releases

### MUSIC

#### PD01 Disc

Contains Soundtracker playroutine plus the following tunes: Aces-Hi, Acidbat2, Afl, Alf, ArtNoise, AxelF, Backpopped, Big, Blitzwing, Blizzard02.

#### PD02 Disc

Contains Soundtracker playroutine plus the following tunes: BatMix, Bobby, Brill, Burning, Chartmix, Chipgene, Demo2.

#### PD03 Disc

Contains Soundtracker playroutine plus the following tunes: Confusion, Crack, Criminal, Dear, Demons, Dns, Elephant.

#### PD04 Disc

Contains Soundtracker playroutine plus the following tunes: Doc12, Funky, Ducksong, Electric\_2, EndTheme, Enutomed, Equinox5, FinalTFDMI, FinalVis.

#### PD05 Disc

Contains Soundtracker playroutine plus the following tunes: Fyc, GoodTune, Hello, HowDeepIs, Huba, Humanoid, Hunters, Hymn, Idea, Igarun, IntoB.

#### PD06 Disc

Contains Soundtracker playroutine plus the following tunes: Jazzid, Jmj\_China, LastNinja2, Like, Magnetic4, MegaForce0, Minimize, Mod, New\_Biz.

# Beebug Pub

### DEMOS

#### PD12 Disc

Contains 5 sound and graphics demos from Hugo Fiennes of the Serial Port. All five are stunning examples of what the Arc is capable of.

#### PD21 Disc

Contains three demos, Balls, Balls2 and BIA-Tetris. The latter is a game as well as a demo.

#### PD22 Disc

Contains three demos, Noah, Chips and Demo01.

#### PD23 Disc

Contains four demos, Bounce, Crimbo, ColDemo and Rotate.

#### PD24 Disc

Contains three demos, Demo, Gopher and Overscan.

#### PD25 Disc

Contains four demos, Deskballs, DudsDemo, EgIntro, and Z-Brother.

#### PD 26 Disc

Contains three demos, Sister, Wibble and SkullDemo.

#### PD27 Disc

Contains two demos, GrannyChow and Windows.

### GRAPHICS

#### PD13 Disc

Contains the !Projector application that displays films created with the Ace Computing Mogul package. Six example films are included.

#### PD18 Disc

Contains a program that displays several still and animated ray traced pictures.

### EDUCATION

#### PD14 Disc

Contains REG, a suite of programs for recording student achievement levels in schools. Also, included is a way of recording attainment with Colton Software's Pipedream.

### ART

#### PD15 Disc

Contains Artist+ and BigM, both 256 colour art packages, along with Design, a symmetrical pattern designer.

### MUSIC

#### PD16 Disc

Contains 230 tunes for loading into the music package Maestro, with enough variety to suit most tastes.

### TRICKS AND NOVELTIES

#### PD17 Disc

Contains a collection of 27 amusing trick and novelty programs. Some of them produce the weirdest effects!

### GAMES

#### PD19 Disc

Contains 10 games programs, Adevnture, Battle, Battleships, Connect4, Darts, Fish (Pelmanism), Fruit Machine, Golf, Hangman and Impact.

# Public Domain Software

## PD20 Disc

Contains 12 games programs, Invaders, Line Of Five, Othello, Pelmanism, Rocks, Rubik Cube, Simon, Solitaire, Star Trek, Tetris, Tile Trial and Yahtzee.

## UTILITIES

### PD28 Disc

Contains 20 utilities of various types. These are all extremely good and there is something here no doubt to please everyone. Space does not permit full descriptions but the file list is, 1stFile, ASm2, CloseUp, Crypt, Dir, Display, Drawlink, Dustbin, Filetypes, FileUtils, Find, Keys, Loadprogs, MultiPrint, NewBar, NewCodes, PD\_Impress, PrinterTx, ProgCalc, and Set\_Type.

## CLIPART AND PICTURES

### PD29 Disc

Contains over 4 megabytes of Sprite pictures which can be used as clip art to load into DTP or use in your programs. The files are naturally in a compressed form, and the disc contains the file to uncompress them and has instructions.

### PD30 Disc

Contains over 2 megabytes of Sprite clip art and Draw files to load into DTP or use in your programs. The files are naturally in a compressed form and the disc contains the file to uncompress them and has instructions.

This month we are offering 6 new discs from our Public Domain Library. Further titles will be added in the future.

We are also offering a **Sampler** disc with a selection of public domain programs from all areas of interest.

Our Public Domain discs contain as near as possible to 800k (and not less than 700k). Each disc includes a 'Read Me' file, and there are some instructions with the programs.

It is our policy with our Public Domain Library that the Public Domain discs are available only to RISC User members for £2.99 (postage is 60p for the first disc and 30p for each additional disc). The discs are offered as seen, and we cannot enter into any discussion regarding their contents.

To order phone (0727) 40303,  
Fax (0727) 860263, or write to (quoting your membership number):

**BEEBUG, 117 Hatfield Rd, St. Albans,  
Herts AL1 4JS**

## Public Domain Sampler Disc (PDS1)

This disc contains sample programs from the Beebug Public Domain Software Library. The programs are as follows:

### SOUNDTRACKER

The Soundtracker application is used to play back a music file *Toccata* made of real sampled sounds which are sequenced to form a complete tune lasting several minutes. The quality of this is quite stunning, particularly if played through the computer's monitor speaker, or a hi-fi system.

### ACCOUNTS

This is a home accounts program. There are no instructions included with the program but all functions are selected from the main menu which is self explanatory. An example file is included.

### DISC LABEL

A versatile disc labelling program producing professional looking labels for 3.5" discs. A Help file is included with the program.

### FOLLOW

A novelty program that when run puts a pair of beady eyes on the Desktop which follow the mouse pointer wherever it goes. Eerie!

### HANGMAN

A well presented and implemented version of the old word game of Hangman with an animated finale.

### MULTIPRINT

A utility to allow the printing of files by creating a task list of the files to print before sending them to the printer. A Help file is included within the program.

### ROTATE

A fascinating animated demo in which you can alter the effects by pressing a few keys on the keyboard.

### STD

A useful utility to search for telephone STD codes or find a town from its STD code. A ReadMe file is included in the program.

### WANDA

A novelty demo program that infests your desktop screen with a shoal of bubble-blowing goldfish!

the more sold, the more chance there is of Cygnus doing some more games of this calibre for the Arc. Go get it!

An edition of ARCADE wouldn't be complete without a release from 4th Dimension, now would it? The lads at 4th D have been hard at it as usual. Their latest release is *Powerband* from Gordon Key, the author of many of their other games, including *Holed Out* and *E-Type*.

*Powerband* is a motor racing simulation featuring some sixteen different tracks for you to race on. You can set the performance parameters of your car before you start and hence 'tune' it to suit your own driving abilities.

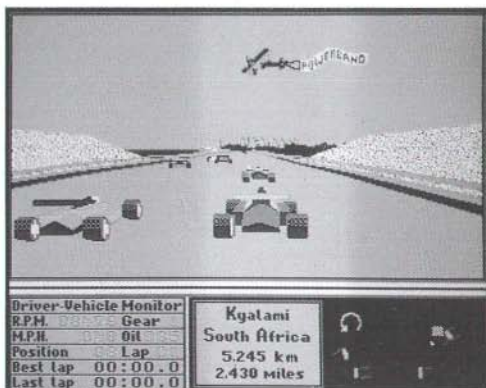
Once you have done this, you are off to the starting grid, either to practice or to take part in a race. You can choose what is known as 'fun' mode to start with, whereby you are in control (?) of an indestructible car. This is most advisable to begin with I assure you, as getting the car round the circuit in one piece is no easy matter. Once you have mastered the controls, you can then move on to racing on more level terms with your competitors, and then finally you can go on to enter the World Championship series of ten races.

*Powerband* is not as easy as say *E-Type* to get to grips with. There are far more hazards to contend with and the speeds are greater too. Also, mastering the controls is a much more involved business.

Graphics and sound in *Powerband* are not what I would call outstanding for the Arc, and I am tempted to say that this game is a bit of a disappointment in that respect. I had hoped for better. There is not the kind of detail that I feel there should be in the

scenery, although the scrolling is smooth and the game is fast.

I have to say that this game does not impress. There is a lot of scope with this type of simulation on a machine of the Arc's capabilities. Sadly, I feel that *Powerband* falls well short of what could really be done.



*Powerband from 4th Dimension*

The trouble now for any software house is that with games like the Cygnus releases, new standards have been set, and the Arc is getting the quality of game that it deserves. Any new releases will be judged against them and buyers of games will become more discerning. I hear that Virgin Mastertronic has five games lined up for the Archimedes. When companies of that size enter the arena and start producing highly polished professional software, then others will have to compete on the same level to survive. It will be interesting and exciting to see what happens in the coming year, as I am sure that if companies like Virgin are sitting up and taking notice of the Archimedes, then others will surely follow.

That's it for this month. See you soon.

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# WP/DTP

## Using DTP Software for Letter Writing

*The article on creating letterheads with Impression in our December issue has created a lot of interest. Here, Maurice Edmundson outlines his own approach with guidance for both Impression and Ovation users.*

The simple task of writing a letter when using DTP software, which is fundamentally designed for more complex layouts, requires a careful choice of method if the best and most efficient way is to be arrived at. Thus a package such as Pipedream 3, although it has many DTP attributes and facilities, nevertheless enables the simpler task of writing a letter to be accomplished easily because it retains many features truly applicable to straightforward word processing. With frame-based packages such as Impression2 and Ovation, rather different strategies have to be adopted.

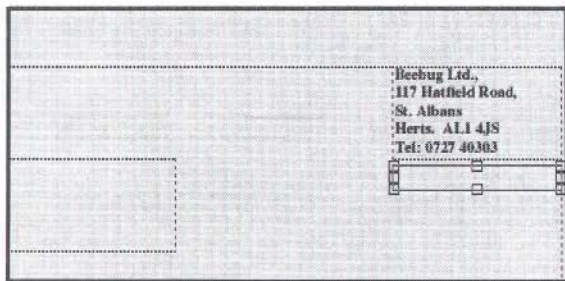
### USING IMPRESSION

In an article in the December issue of Risc User (Volume 4 Issue 2) in the series WP/DTP the author made a number of suggestions on this subject which whilst not incorrect, I feel require further clarification and extension. Much depends on what other equipment is used with the package. For example, if you are using a dot matrix printer and feeding each sheet in by hand, then the method described may not add significantly to the inconvenience especially if you are using the printer's own fonts in what Impression calls "draft mode".

But if you are using a sheet feeder, or fanfold paper, or loose sheets in the cassette tray of a laser or direct-laser printer with a RISC OS type printer driver, then the suggested method is most inefficient. Using two Master Pages as advocated in the article means that the letter is split into two documents. Having printed the first page, the second and subsequent pages will have to be loaded as another document in its place, and printing started afresh. If two Master Pages are required in one document the

second should be entered using the *New Chapter* option but this is not particularly helpful here. A possible alternative approach would be to mark the Master Page with guide frames rather than full frames, and this would enable follow-on pages to be created without the need for a second design of Master Page.

However, I believe the simplest solution is not to use a Master Page at all. Using the layout as described in the December article, create the two address frames and the date frame as local frames on page 1 of the document (not the Master Page), but do *not* create the main text frame below these as suggested in the article (it is a hindrance to page flow). Just use the Master Global Frame which already exists.



**Letterhead layout using Impression**

Plain continuation sheets then follow without further ado, and the whole letter can be printed in one operation. The moral seems to be that one doesn't always need a Master Page. Once the document page is set up as required, complete with your address in the top right-hand corner, save it with a name such as *LetterHd*, and this becomes the blank starting document for all correspondence. Of course, once the letter is written it must be saved under a new name, to prevent over-writing the "master" letter-headed sheet (indeed, lock the file to prevent overwriting). Impression 2 allows saving under different names.

Should the pages require numbering (not appropriate if there is only one page, but unavoidable if page numbering is entered onto a Master Page), this too is easily done within a local repeat frame on the document pages. Draw it below the global frame. It will be present as a blank frame on every page (invisible when printed). If the letter runs to two pages or more, enter the page number into this narrow frame on the first page, by clicking on the appropriate "insert" menu option under "miscellaneous". All pages will then be numbered in sequence.

To summarise, here are the steps to follow with suggested dimensions for the "Alter Frame" dialogue box:

1. Select the Master Page of a new document, and adjust the Global Frame to suit. e.g. X = 15mm; Y = 20mm; width = 180mm; height = 252mm. Remove it from the screen.
2. Set out the address and date frames not on the Master Page but on the first document page. Add a new frame about 8mm deep along the bottom, the full width of the Master Frame using the Repeat Frame option. Suggested values in mm are given in table 1.

|                                   | OriginX | OriginY | Width | Height |
|-----------------------------------|---------|---------|-------|--------|
| Your own address frame            | 140     | 15      | 55    | 30     |
| Recipient's address frame         | 15      | 50      | 55    | 30     |
| Date frame                        | 140     | 52      | 55    | 8      |
| Date frame (using a repeat frame) | 15      | 270     | 180   | 8      |

Table 1. Suggested frame sizes for letterheads

Note: If you are using window envelopes then the recipient's address frame may require other values than those above, discovered by experimentation as described in the December article.

3. Type your own address in the top right-hand frame. For emphasis use, say, 14pt Trinity bold.
4. Choose the Style and Effect which will be used within the letter; e.g. Body Text=12pt Trinity Medium; full justification, etc. These will be saved with the "template" in the next step.
5. Save the document as "LetterHd" in a directory called "Masters". Now continue with the letter.

6. If numbering is required, insert "page number" from the *miscellaneous* menu, centred in the narrow bottom frame, otherwise leave blank.

7. Add the date to the date frame using the option in the *miscellaneous* menu.

8. Type in the recipient's address in its frame.

9. Move to the main text frame and write the letter. The text will flow onto a continuation page automatically, and it will be correctly numbered as page 2.

10. Save the letter under a different name in the general directory.

### USING OVATION

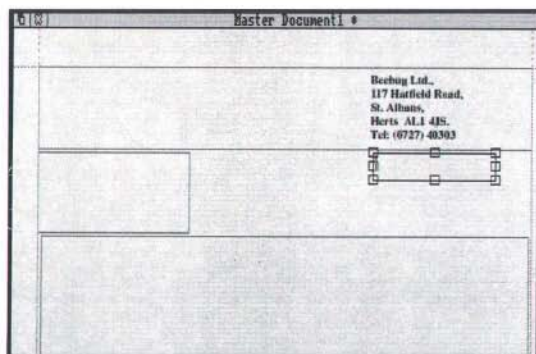
The instructions above also apply to letter writing using BEEBUG's Ovation. As with Impression, if plain continuation sheets are required, then the layout of the first sheet must be on a document page and not on a Master Page, except for the footer frame holding the page number, since there are no local repeat frames in Ovation. Load it in each time a letter has to be written, but save the letter under a new name to prevent overwriting the template. This is the simplest way of writing a letter in Ovation.

However Ovation has one special feature of its own which can be put to good use viz. the ability to save a Style Sheet. A Style Sheet will save the frames from a Master Page as well as the text styles etc. It

will not save any text on the Master Page, unless that text is in a header or footer. Thus you can use a header to store your address and it will be preserved along with the rest of the layout. Here then are the instructions for saving a letter template in Ovation, using the Style Sheet feature.

1. Prepare a Master Page from the "new document" option, adjusting margins to suit (e.g. top 15mm; bottom 20mm; left 15mm; right 15mm).
2. Add a header margin 30mm deep and a footer 8mm deep.
3. Type your address into the header frame positioning it towards the right

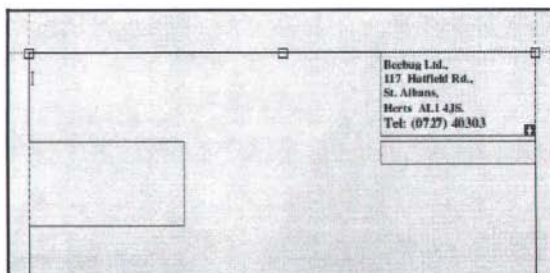
using space or Tab and 14pt Trinity bold (or whatever typeface you prefer).



*Letterhead layout using Ovation*

4. Add text frames for the date and the recipient's address but leave blank.

5. Add a frame for the main body of the letter from just below the addressee frame to the footer frame, positioning it just inside the global Master Frame. I pointed out above that in some circumstances such a frame would inhibit text flow. As you will see shortly, this is precisely what is wanted with this template, so the extra frame is included.



*Ovation's Master Page saved as a style sheet*

6. Select the "page" option from the menu and choose "alter chapter - after the current chapter".

7. A repeat of the existing Master Page will appear, which you must now clear of unwanted frames and text, i.e. select "show page guidelines" from the "page" option and make header = 0mm. Delete all the other frames except the footer. You now have a plain continuation sheet following on from the first page.

8. Modify Bodytext if you prefer a font other than SwissB 12pt.

9. Save everything as a Style Sheet, called for example, "Newletter".

Now when a letter is required, click on this Style Sheet icon in the directory,

and a document page will open up complete with your address, ready to enter the date and the rest of the details of your letter in the chosen type face, together with a plain continuation sheet waiting in the wings below the screen. But do not forget that this continuation page is a new chapter.

Text cannot flow from one chapter to another. But the large text frame on page one will inhibit this and if you accidentally type off the last line, a new page will not be inserted and you will realise that you must reposition the caret on page two before continuing. After that, correctly numbered continuation sheets will appear automatically. All the pages can then be printed in one operation.

There is of course, a third method applicable to all DTP packages. That is to use headed notepaper on which the address already exists. Then only the date and recipient's address frames need be prepared; these can be on a document page and will allow multi-paged letters to be written without difficulty. As before, you will have to preserve the blank version as your master, and save each letter under a different name. Headed sheets can be prepared in quantity in advance, as required. In the more sophisticated printers the correct order of headed and plain sheets will have to be observed in the paper tray although if you have a double bin system one can hold headed sheets and the other plain.

**RU**

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# Programmer's Workshop

## An ADFS Disc Examiner

David Spencer presents a program to back up the theory of the last two articles.

For the past two Programmer's Workshops, we have looked at the nature of E format ADFS discs, paying particular attention to the layout of the map and directory structures. In this article, we shall move away from the theory and present a simple program which enables you to examine a disc. In its basic form given here, Dedit, as the program is called, allows disc contents to be examined, in both ASCII and hex (byte or word) formats. This month's magazine disc contains an enhanced version of the program that provides a number of other features including display of the boot block, map and directory information, and the ability to 'goto' a particular sector, or the start of a particular file or directory.

Future additions will provide full editing facilities, including automatic recalculation of map and directory checksums, and map integrity checking.

To create the Dedit application you will need to create an application directory called '!Dedit', and build within it a '!Run' file to set a suitable Wimp slot (32K should be sufficient), and to run '!RunImage'. The program listed here should be typed in and saved as '!RunImage' within the application directory. Finally, you will need to create a !Sprites file containing a sprite called !Dedit. This should be 68 by 68 OS-units, as usual, and is used for both the directory viewer and icon bar. For more details on creating application directories refer to the article in RISC User Volume 0 Issue 0 (page 00).

### USING DEDIT

When run, Dedit will install itself on the icon bar. Clicking on the icon will open a window that will default to displaying the contents of drive 0 if a disc is present, or drive 4 otherwise. The format of the

display is:

```
<disc address> : <hex data> : <ASCII>
```

Clicking menu will display a menu with four options. The first of these, 'Drive', will step on to the next valid drive that contains a disc. The second entry, 'Display' switches between byte and word type displays for the hex data. The final two options, 'Forward' and 'Back', move through the disc sector by sector in the corresponding direction.

You can quit from Dedit by choosing the 'Quit' option from the icon bar menu.

```
10 REM                > !RunImage
20 REM Program      Disc Examiner
30 REM Version      A 1.0
40 REM Author       David Spencer
50 REM RISC User    April 1991
60 REM Program      Subject to Copyright
70 :
80 DIM block 200, mt 40
90 DIM menu 200, buffer% 4096
100 word=TRUE:drive%=3
110 $block="TASK":SYS "Wimp_Initialise
",200,!block,"Disc Examine" TO ,task
120 main=FNcreate(0,100,1048,544,&FF00
0002,0,1048,544,3,mt)
130 PROCicon=open=FALSE
140 PROCnewdrive
150 boffset%=0:PROCgetshape
160 PROCreaddisc
170 quit=FALSE:PROCTitle
180 ON ERROR PROCerror
190 REPEAT
200 SYS "Wimp_Poll",1,block TO reason
210 CASE reason OF
220 WHEN 1:PROCredraw(!block)
230 WHEN 2:SYS "Wimp_OpenWindow",,block
240 WHEN 3:PROCclose(!block)
250 WHEN 6:PROCbuttons(block)
260 WHEN 7:PROCsave
270 WHEN 8:PROCkey(block)
```

```
280 WHEN 9:PROCmenuselect(block)
290 WHEN 17,18:PROCreceive(block)
300 ENDCASE
310 UNTIL quit
320 SYS "Wimp_CloseDown"
330 END
340 :
350 DEF PROCreceive(b)
360 CASE b!16 OF
370 WHEN 0:quit=TRUE
380 ENDCASE
390 ENDPROC
400 :
410 DEF FNcreate(vx,vy,w,h,flags,bcol,
x,y,waf,title)
420 $block=STRING$(88,CHR$0)
430 !block=vx:block!4=vy
440 block!8=vx+w:block!12=vy+h
450 block!24=-1:block!28=flags
460 block?32=7:block?33=2
470 block?34=7:block?35=bcol
480 block?36=3:block?37=1
490 block?38=12
500 block!44=-y:block!48=x
510 block!56=413D:block!60=waf<<12
520 block!72=title:block!76=-1
530 block!80=LEN$title
540 SYS "Wimp_CreateWindow",,block TO
handle
550 =handle
560 :
570 DEF PROCredraw(handle)
580 IF handle=main THEN
590 !block=handle
600 SYS "Wimp_RedrawWindow",,block TO
more
610 WHILE more
620 PROCworkarea
630 SYS "Wimp_GetRectangle",,block TO
more
640 ENDWHILE
650 ENDIF
660 ENDPROC
670 :
680 DEF PROCbuttons(b)
690 IF b!8 AND 2 THEN
700 PROCmenu(b)
710 ELSE
720 CASE b!12 OF
730 WHEN -2
740 IF NOTopen THEN
750 PROCnewsize
760 !block=main
770 SYS "Wimp_GetWindowState",,block
780 SYS "Wimp_OpenWindow",,block
790 open=TRUE
800 ENDIF
810 ENDCASE
820 ENDIF
830 ENDPROC
840 :
850 DEF PROCclose(handle)
860 IF handle=main THEN open=FALSE
870 !block=handle
880 SYS "Wimp_CloseWindow",,block
890 ENDPROC
900 :
910 DEF PROCworkarea
920 ox=block!4-block!20
930 oy=block!16-block!24
940 FOR count=0TO(bsize%/16)-1
950 pos=oy-32*count-4
960 IF NOT(pos<block!32 OR pos-32>bloc
k!40) THEN
970 MOVE ox+4,pos
980 PRINT RIGHT$("00000000"+STR$(boffs
et%+count*16),8);" ";
990 IF word THEN
1000 FOR F%=0 TO 3
1010 PRINT RIGHT$("00000000"+STR$(buffe
r%!(count*16+F%*4)),8);" ";
1020 NEXT
1030 ELSE
1040 FOR F%=0 TO 15
1050 PRINT RIGHT$("0"+STR$(buffer%?(co
unt*16+F%)),2);" ";
1060 NEXT
1070 ENDIF
1080 PRINT": ";
1090 FOR F%=0 TO 15
1100 char=buffer%?(count*16+F%)
1110 IF char<33 char=ASC"."
1120 PRINT CHR$char;
1130 NEXT
1140 ENDIF
1150 NEXT
1160 ENDPROC
1170 :
```

```

1180 DEF PROCmenu(b)
1190 CASE b!12 OF
1200 WHEN -2:PROCdrawmenu(1,"Dedit,Quit")
1210 SYS "Wimp_CreateMenu",,menu+4,!b-6
1220 WHEN main:PROCdrawmenu(2,"Dedit,Drive,Word,Forward,Back")
1230 SYS "Wimp_CreateMenu",,menu+4,!b-3
1240 ENDCASE
1250 ENDPROC
1260 :
1270 DEF PROCdrawmenu(handle,menu$)
1280 !menu=handle:menu?16=7
1290 menu?17=2:menu?18=7:menu?19=0
1300 menu!20=128:menu!24=40
1310 menu!28=0:ptr=menu+32
1320 $(menu+4)=LEFT$(menu$,INSTR(menu$,"",-1))
1330 menu$=menu$+" "
1340 WHILE menu$<>" "
1350 menu$=MID$(menu$,INSTR(menu$,"")+1)
1360 IF menu$<>" " THEN
1370 !ptr=0:ptr!4=-1
1380 ptr!8=&7000021
1390 $(ptr+12)=LEFT$(menu$,INSTR(menu$,"",-1))
1400 ptr+=24
1410 ENDIF
1420 ENDWHILE
1430 ptr!-24=ptr!-24 OR &80
1440 ENDPROC
1450 :
1460 DEF PROCmenuselect(b)
1470 SYS "Wimp_GetPointerInfo",,block+20
1480 IF (block!28 AND 1) reopen=TRUE ELSE reopen=FALSE
1490 CASE !menu OF
1500 WHEN 1
1510 CASE !b OF
1520 WHEN 0:quit=TRUE
1530 ENDCASE
1540 WHEN 2
1550 CASE !b OF
1560 WHEN 0:PROCnewdrive
1570 WHEN 1:PROCchangeview
1580 WHEN 2:PROCmove(TRUE)
1590 WHEN 3:PROCmove(FALSE)
1600 ENDCASE
1610 ENDCASE
1620 IF reopen SYS "Wimp_CreateMenu",,menu+4
1630 ENDPROC
1640 :
1650 DEF PROCerror
1660 SYS "Wimp_DragBox",,-1
1670 !block=ERR
1680 $(block+4)=REPORT$+" (Internal error code "+STR$ERL+)" +CHR$0
1690 SYS "Wimp_ReportError",block,1,"Disc Viewer"
1700 ENDPROC
1710 :
1720 DEF PROCicon
1730 !block=-1:block!4=0
1740 block!8=0:block!12=68
1750 block!16=68:block!20=&3002
1760 $(block+24)="!dedit"
1770 SYS "Wimp_CreateIcon",,block
1780 ENDPROC
1790 :
1800 DEF PROCnewsize
1810 !block=0:block!12=0
1820 IF word block!8=1048 ELSE block!8=
1240
1830 block!4=- (bsize%/16*32+8)
1840 SYS "Wimp_SetExtent",main,block
1850 IF open THEN
1860 !block=main
1870 SYS "Wimp_GetWindowState",,block
1880 SYS "Wimp_OpenWindow",,block
1890 ENDIF
1900 ENDPROC
1910 :
1920 DEF PROCchangeview
1930 word=NOT word
1940 PROCnewsize
1950 PROCforce
1960 ENDPROC
1970 :
1980 DEF PROCforce
1990 !block=main
2000 SYS "Wimp_GetWindowState",,block
2010 SYS "Wimp_ForceRedraw",-1,block!4,block!8,block!12,block!16
2020 ENDPROC

```

```

2030 :
2040 DEF PROCgetshape
2050 SYS "ADFS_DescribeDisc", ":"+STR$drive%,block
2060 size%=block!16:bsize%=2^block?0
2070 ENDPROC
2080 :
2090 DEF PROCTitle
2100 $mt="Dedit :"+STR$drive%+" "+RIGHT$("0000000"+STR$-boffset%,8)
2110 IF open THEN
2120 !block=main
2130 SYS "Wimp_GetWindowState",,block
2140 SYS "Wimp_CloseWindow",,block
2150 SYS "Wimp_OpenWindow",,block
2160 ENDIF
2170 ENDPROC
2180 :
2190 DEF PROCnewdrive
2200 olddrive%=drive%
2210 drive%+=1:IF drive%=8 drive%=0
2220 LOCAL ERROR
2230 ON ERROR LOCAL drive%+=1:IF drive%
=8 drive%=0
2240 IF drive%=olddrive% ERROR 0,Bad drive
2250 PROCgetshape
2260 RESTORE ERROR
2270 boffset%=0
2280 PROCTitle:PROCreaddisc
2290 PROCnewsize:PROCforce
2300 ENDPROC
2310 :
2320 DEF PROCreaddisc
2330 SYS "ADFS_DiscOp",,1,boffset%+(drive%<<29),buffer%,bsize%
2340 ENDPROC
2350 :
2360 DEF PROCmove(dir)
2370 IF dir AND boffset%+bsize%<size% boffset%+=bsize%
2380 IF NOT dir AND boffset%>0 boffset%-=bsize%
2390 PROCreaddisc:PROCforce
2400 PROCTitle
2410 ENDPROC

```

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# Mastering the Wimp

## Part 17: Accessing the printer drivers

by Lee Calcraft

By using a system of standardised printer drivers, Acorn have made the provision of hardcopy a relatively painless affair for programmers. Without the drivers, each application writer would need to incorporate separate driver routines in each application for each of the printer types with which his software might be used. Instead he is provided with a uniform interface with which to communicate - one which we might call a virtual printer. This month I want to look at the way in which Wimp applications can access the drivers to produce hardcopy; though I should add that the drivers can be accessed equally effectively from outside the Desktop using similar code to that presented here.

In broad terms, the code to send text and graphics to a printer driver to create a single page is similar to that used to redraw a Wimp window. A WHILE loop is used in which the printer driver repeatedly returns the co-ordinates of a rectangle whose contents the application must draw. This continues until the driver says that it has had enough. Preparations are then made to repeat the procedure for the next page, and so on until the end of the document.

In contrast to window redraw routines however, before the WHILE loop is entered, the application must give the co-ordinates of one or more rectangles to be drawn, and must say whereabouts on the page they are to be reproduced. A single rectangle could cover an entire page, or a page might be made up of a considerable number of smaller rectangles. Since each rectangle can contain any combination of objects: text, graphics or sprites, great flexibility is possible. Table 1 expands the process in pseudo code.

```
Check that a driver is installed
Use SYS "PDriver_PageSize" to obtain
dimensions of printable area etc.
SYS "PDriver_SelectJob" to initiate the
process
```

```
FOR page=1 TO total
  Make one or more calls to SYS
  "PDriver_GiveRectangle" to nominate
  areas to be printed on this page
  Call SYS "PDriver_DrawPage" to begin
  drawing process
  WHILE more
    draw text and graphics as required
    SYS "PDriver_GetRectangle"
  ENDWHILE
NEXT page
SYS "PDriver_EndJob"
```

Table 1. Pseudo code representation of the printer driver interface

### SOME REAL CODE

This gives the broad outline of what is going on, but the finer detail will only really emerge with reference to a real example. Listing 1 contains just two procedures PROCredraw and PROCprint. The latter accesses the printer drivers and prints some text and a simple graphics object (a shaded rectangle), and is complete in itself. You should be able to plug it into any Wimp application. If you want to use it with last month's program, simply replace PROCdraw with the version appearing in listing 1 here, and add the following line to the definition of PROCpoll:

```
WHEN 6:PROCprint
```

The effect of these changes is to replace the mass of text appearing in last month's window with a single instruction to "Click the mouse to print", below which there sits a blue rectangle. On clicking any of the mouse buttons when the

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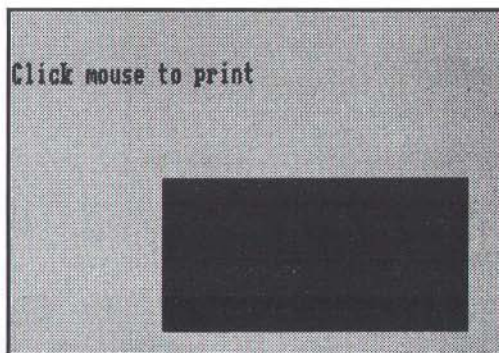
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pointer is over the window, printout will begin, and the hourglass will appear. The printer driver task ensures that the Escape key is active during printout, and may be used to abort it for any reason.



*Printed output from the program*

By taking a closer look at the definition of PROCprint we can see how the code has been implemented. The first line (2150 in the listing) dimensions four small areas of memory for use with the SYS calls. Ideally this line should appear at the start of the main program, but I have included it at this point to keep the code together. The drawback with this is that the areas are reallocated every time that the procedure is called - but we can live with this since it is only a test program, and we only lose 56 bytes a throw.

Next, RMEnsure is used to check that a driver has been installed. Note that drivers still remain installed even after you select "Quit" on the driver application icon on the icon bar. There ought really to be an extra option on the driver menus: "Quit and clear".

If all is well, the hourglass is turned on with SYS "Hourglass\_On". Lines 2180 and 2190 initiate the printing job. The first opens a file to the printer - as distinct from the current filing system - in the style of C and UNIX, while the

second calls SYS "PDriver\_SelectJob", supplying the file handle of the printer file, and a name for the job. This suspends the current print job if there is one, and renders the nominated job current. The name supplied with the job is used in different ways by different printer drivers. Some will ignore it, while the PostScript driver, for example, includes it in the PostScript header which it generates.

The next task for our procedure is to set up a local error handler. This is necessary because we need to abort the print job if any error occurs while printing is in progress. This is achieved with a call to SYS "PDriver\_AbortJob".

The lines from 2200 to 2290 are concerned with setting up the parameters for the call to SYS "PDriver\_GiveRectangle". These are given in table 2.

|    |                                                              |
|----|--------------------------------------------------------------|
| R0 | rectangle identification word                                |
| R1 | ptr to 4 word block containing the rect to be plotted        |
| R2 | ptr to 4 word block containing transformation table          |
| R3 | ptr to 2 word block containing bottom lhs coord of plot posn |
| R4 | bgnd colour for the rectangle in the form &bbgrr00           |

**Table 2. The Parameters of SYS "PDriver\_GiveRectangle" SWI &8014B**

The identification word is reported back to the application when the Wimp requests that it must be plotted. We have used zero for this parameter. R1 supplies the co-ordinates in OS units of the rectangle which the task wishes to plot. In our example we have used 0,0,700,500. These co-ordinates only really have any bearing on the code which will plot the objects. So for example, to make sure that our rectangle will appear on the printout, we just need to keep it within this area.

R2 supplies the so-called transformation table which will be applied to the co-ordinates of the supplied rectangle. It uses the following transformation:

$$x' = (x * R2!0 + y * R2!8) / 2^16$$

$$y' = (x * R2!4 + y * R2!12) / 2^16$$

In the example we have used a unit transformation so that the rectangle appears size for size, but it is possible to shrink, expand or rotate it by altering the values supplied. But note that all standard drivers except the PostScript driver reject all but the simplest transformations, and disallow any rotational element, throwing up an error box.

R3 supplies the co-ordinates at which the bottom left-hand corner of the rectangle will be plotted, and thus allows you to place your rectangle anywhere on the paper that you wish. The co-ordinates are given in milli-points. This very small unit is one thousandth of a point (text in RISC User is around 10 points high). There are 72000 milli-points to one inch, and in the program, I have placed the rectangle two inches from the left-hand edge, and six inches from the bottom.

In doing this I have not taken account of the actual page size of the paper as understood by the particular driver in use, neither have I taken account of the page borders. To get information on these factors, you can use SYS "PDriver\_PageSize". Full details of this are given in the PRM page 1545, but table 3 should provide enough information to use the call.

The final parameter supplied to SYS "PDriver\_GiveRectangle" is the palette to be used when drawing the background of the task-nominated rectangle. This and all other associated palette data is supplied in the form:

&bbggr00

where bb is the quantity of blue, gg the

quantity of green, and so on. White - or blank paper - is unexpectedly made up of 100% of each of the component colours, just as it would be on screen. White is therefore &FFFFFF00. The two zeros at the end are unused, and the lower nibble of each colour should be a copy of the top nibble (because ScreenSaves fail to follow this rule, printouts of such files have dirty whites). Thus a mid-grey halftone might be given by:

&88888800

- |    |                                   |
|----|-----------------------------------|
| R1 | x size of paper including margins |
| R2 | y size of paper including margins |
| R3 | left edge of printable area       |
| R4 | bottom edge of printable area     |
| R5 | right edge of printable area      |
| R6 | top edge of printable area        |

All units are in milli-points, and R3-R6 are given relative to the bottom left-hand corner of the page.

**Table 3. Parameters returned by SYS "PDriver\_PageSize" SWI &80143**

As I mentioned earlier, any number of rectangles may be specified for a given printed page, although we have only used one in the example. Any others should be added immediately after the first, re-setting the parameter blocks as required.

Next we begin the plotting loop itself. This takes the form of a single call to SYS "PDriver\_DrawPage" followed by a WHILE loop which makes repeated calls to SYS "PDriver\_GetRectangle". The parameters supplied with the former are given in table 4.

The plotting loop in our program is a simple one in which each plotting request causes the whole of the area to be replotted (though of course the printer driver software will clip anything drawn outside the rectangle which it nominates). It is just like the contents of the equivalent redraw loop except that colours are set using SYS "ColourTrans\_SetGcol"

rather than "Wimp\_SetGcol". This ensures that accurate colour representation takes place in a manner independent of the current screen mode. Colours are again supplied in palette format, as described above.

|         |                                                       |
|---------|-------------------------------------------------------|
| R0      | number of copies to print                             |
| R1      | ptr to 4 word block to receive the rectangle to print |
| R2      | page sequence number, or 0                            |
| R3      | zero, or points to a page number string               |
| On exit |                                                       |
| R0      | non-zero if more rectangles required                  |
| R1      | reserved                                              |
| R2      | rectangle identification word                         |
| R3      | reserved                                              |

**Table 4. Parameters used with SYS "PDriver\_DrawPage" SWI &8014C**

Note that since the ColourTrans SWIs are currently provided in RAM, our application should include the following two lines in its !Run Obey file:

```
RMEnsure ColourTrans 0.51 RMLoad System:Modules.Colours
```

```
RMEnsure ColourTrans 0.51 Error You need ColourTrans 0.51 or later
```

Once the WHILE loop exits, we only need to call SYS "PDriver\_EndJob", and turn off the hourglass. Simple really.

*Next month as the series draws to a close, we will be taking a look at using the outline fonts with the Wimp, and at sending outline fonts to the printer drivers.*

```
2000 DEFPROCdraw
2010 SYS "Wimp_RedrawWindow",,block% TO more%
2020 x0%=16+block%!4-block%!20
2030 y0%=-16+block%!16-block%!24
2040 WHILE more%
2050   SYS "Wimp_SetColour",11
2060   MOVE x0%,y0%
2070   PRINT "Click mouse to print"
2080   SYS "Wimp_SetColour",8
2090   RECTANGLE FILL x0%+20,y0%-300,40
```

```
0,200
2100   SYS "Wimp_GetRectangle",,block%
TO more%
2110 ENDWHILE
2120 ENDPROC
2130 :
2140 DEFPROCprint
2150 DIM trans% 16,rect% 16,plotat% 8,rectin% 16
2160 OSCLI ("RMensure PDriver 0 ERROR 255 No printer driver installed")
2170 SYS "Hourglass_On"
2180 pf%=OPENOUT("printer:")
2190 SYS "PDriver_SelectJob",pf%,"Test job"
2200 LOCAL ERROR
2210 ON ERROR LOCAL:RESTORE ERROR:SYS "PDriver_AbortJob",pf%:CLOSE#pf%:PROCerror:ENDPROC
2220 REM Given rectangle
2230 rect%!0=0:rect%!4=0
2240 rect%!8=700:rect%!12=500
2250 REM Transformation
2260 trans%!0=1<<16:trans%!4=0<<16
2270 trans%!8=0<<16:trans%!12=1<<16
2280 REM Where to plot it in milli pts
2290 plotat%!0=2*72000:plotat%!4=6*72000
2300 SYS "PDriver_GiveRectangle",0,rect%,trans%,plotat%,&CCCCC00
2310 SYS "PDriver_DrawPage",1,rectin%,0,0 TO more%
2320 WHILE more%
2330   SYS "ColourTrans_SetGCOL",&00000000
2340   MOVE 0,400
2350   PRINT "Click mouse to print"
2360   SYS "ColourTrans_SetGCOL",&33333300
2370   RECTANGLE FILL 200,50,400,200
2380   SYS "PDriver_GetRectangle",rectin% TO more%
2390 ENDWHILE
2400 SYS "PDriver_EndJob",pf%
2410 SYS "Hourglass_Off"
2420 RESTORE ERROR
2430 CLOSE#pf%
2440 SOUND 1,-15,70,10
2450 ENDPROC
```

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# Into the Arc

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## RISC OS for Beginners (Part 2)

by Alan Wrigley

**I**n last month's Into the Arc we unravelled the confusion about system resources experienced by many newcomers to the Arc. This month I will explain some of the mysteries of the filing system, with particular reference to problems which crop up again and again in queries from RISC User readers, using the question and answer approach we adopted last month. I will concentrate on the Advanced Disc Filing System (ADFS), since this is supplied as standard on all A3000 and Archimedes models (though the A540 also has a SCSI filing system, which I will refer to later). All commands mentioned in this article are fully documented in the User Guide, to which you should refer if you need further information.

*On my old BBC model B, filing was delightfully simple. Cataloguing a disc showed all the files on it, and I never needed to worry about pathnames or complicated directory structures. Why does the Archimedes have to be so complex?*

The ADFS is a hierarchical filing system, and as such has many advantages over the simple DFS of the model B. This concept is not unique to the Arc - the ADFS itself was fitted as standard on the BBC Master, and many other widely-used systems, including MS-DOS, use a hierarchical structure, so you need not imagine that the Arc is especially unfriendly. A hierarchical system allows you to keep data on a disc in a much more organised way, and also allows you to keep many more files on one disc than is possible with the DFS, for example. Unfortunately the price you pay for power and flexibility is a little more complexity in operation, but this is true of any product, from cars to video recorders. With a little persistence, the ADFS should hold no more terrors than anything else.

*Well, I appreciate that, but it's very difficult to understand sometimes what is going on. For example, why am I sometimes asked to insert a disc which I haven't used for a couple of hours, and which I have no further need for? Surely there must be something wrong with a filing system which behaves like that?*

Last month we explained that many programs need certain shared resources, such as the C library and so on. If the !System folder was first seen on a disc which is no longer in the drive, but has not been dismounted, the operating system will try to access that disc if you run a program which needs any of those resources. You should always bear in mind that, unless you specifically dismount a disc (usually by selecting the menu option from the drive icon), the ADFS remembers it by name and keeps a record of what is in any directories which have been opened, though the number which it can keep track of is limited by the memory allocated for this purpose (which you can set yourself using \*Configure ADFSDirCache).

This latter fact explains another reason why you are sometimes asked to insert a disc: if you have directory viewers open on the Desktop for several discs, the ADFS may have had to discard an old directory from its cache, even though the window is still visible on the screen. The next time the Desktop display is updated, it will need to see the disc again in case the window is to be updated.

*Why is it that sometimes I have a directory viewer open on the Desktop, but typing \*Cat at the command line shows me a completely different directory, sometimes even a different disc? Also, particularly when running non-multi-tasking programs, I am sometimes told a file can't be found*

*when I know perfectly well it's on the disc. I find this most infuriating. Is it something to do with this CSD thing that people keep mentioning?*

It is indeed. The Currently Selected Directory (CSD) has a significant bearing on many filing system operations, but it can lead to a lot of misunderstandings. Basically, the CSD is the directory in which the ADFS will look first when asked to perform a filing operation, unless a full pathname has been specified (I will explain full pathnames in a moment). In other words, it will only look down the directory structure from where it is at present. Imagine you are sitting on a branch of a tree, and can only look outwards along the branch. You can see anything beyond you on the same branch, or any subsidiary branches, but not on the rest of the tree. The hierarchical structure of the ADFS makes it behave in a similar way.

It is important to realise that the CSD can only ever be explicitly set; it doesn't change at random or in response to other actions. For example, when you mount a disc (by typing `*Mount`, or switching the computer on with a disc in the drive and the machine configured to Directory) the CSD is set to the root directory of that disc. You can change the CSD by using `*Dir <directory name>`, or by using a utility (such as our *CSD* on the Volume 3 Issue 9 disc), or it may be set by a program which needs to do so. So if the CSD is set to a directory on one disc, and you put a second disc in the drive, typing `*Cat` at the command line will still display the contents of the CSD on the first disc.

It is also important to realise that the CSD is not affected by Filer operations within the Desktop. You can open as many directory windows as you like, but the CSD will remain the same unless changed by one of the methods described above. In a multi-tasking world, the concept of a CSD is less important; no one application has a right to alter it to suit itself, so other methods are employed to ensure that

applications know where to find their resources, by using system variables like `Obey$Dir`.

*Ah yes, Obey\$Dir; another meaningless piece of jargon that keeps cropping up just to confuse me. You also promised to tell me about pathnames.*

`Obey$Dir` is an example of what is known as a system variable. There are a number of these which are maintained by RISC OS and used to store information which is needed to perform certain operations. Whenever an Obey file is executed, `Obey$Dir` is automatically set to the full pathname of the directory containing that Obey file. Virtually all multi-tasking applications use this to their advantage. When you double-click on an application's icon, its !Run file is run. This is always an Obey file, and hence `Obey$Dir` is set to the application directory. All the application needs to do is set a variable of its own to the current value of `Obey$Dir`, and it can then use that pathname at any future point to find any files which it knows are there.

The value stored in `Obey$Dir` is always a full pathname, and this brings me on to your second point. A full pathname holds the *complete* path to the object specified, from the filing system name right down to the file or directory in question. Here are two examples:

```
adfs::MyDisc.$.Letters.Business.Taxman
net#FS:&.Fred.Apps.!MyApp
```

In the first example, the Filer will look for an ADFS disc called *MyDisc*, then at its root directory (`$`), a further directory called *Letters*, a sub-directory of this called *Business*, and finally a file called *Taxman* located in the *Business* directory. Note the use of the disc name rather than a drive number; although "MyDisc" could have been replaced by "0" (assuming the disc is in drive 0), you should get into the habit of always using disc names.

The second example specifies a network fileserver called *FS*, followed by the user root directory (`&`), a further

directory called *Fred*, and then an application directory called *!MyApp* inside a directory called *Apps*.

The whole point about pathnames is that each is unique, and enables the Filer to find a file wherever it might be, regardless of the CSD, provided that it recognises the filing system specified, and that the disc name is known to that filing system (i.e. a directory viewer has been opened onto the disc and it has not subsequently been dismounted).

***You say I should always use disc names. Why is that?***

A powerful feature of the ADFS as implemented under RISC OS is the ability to keep information on a number of discs at any one time. On a single floppy machine, this allows you to swap between several frequently-used discs without needing to inform the ADFS every time you change the actual disc in the drive. Each time a directory viewer is opened onto a disc, by clicking on the drive icon, the ADFS remembers that disc by name until it is dismounted or the computer is reset. If you try to access a disc which is known to the system but is not currently in the drive, you will be asked to insert that disc, as mentioned earlier. You will also notice that re-displaying a directory viewer seen previously is faster because the information is already in memory and does not have to be re-read from the disc.

It follows from this that you should always give your discs meaningful names, and preferably write that name on the disc label. When a disc is first formatted, it is given a name based on the time and day of the week, e.g. *15\_21\_Thu*. If you are working with half a dozen discs, say, and you are asked to insert *11\_56\_Mon*, are you going to know which one that is? Of course not.

***You say the ADFS is only one of a number of filing systems. What others are there, and will I have to re-learn everything if I come across one?***

In theory, any item of hardware which provides a medium for storing data can have its own filing system. In practice, the average user will not often meet many of these, and in any case, provided that the filing system software has been written correctly, the principles should be much the same as the ADFS. It is not in anyone's interests if users have to re-learn to use their computer each time they add an item of hardware.

As well as the ADFS, every Arc already has one other filing system built in, which is the RAM filing system (RAMFS). This allows you to use part of the computer's memory as if it were a disc drive. Access time is very fast, but the data is lost whenever you switch off or reset the machine. The RAMFS has some worthwhile uses, and I will look at these next month.

Two other systems which you may come across are the NFS (Network Filing System) and SCSI (Small Computer Systems Interface). Many hard drives being sold these days use SCSI rather than ADFS (the A540 actually comes with a SCSI hard disc fitted as standard). What this means in practice is that you must also have a SCSI interface in the computer, and SCSIIFS will appear on your icon bar as a separate filing system. NFS is only usable if you have an Econet interface fitted, and again, it will be accessed from a separate icon on the icon bar.

Using either of these systems is very much like using the ADFS. Many of the points covered in this article are applicable to all filing systems, though one important point to bear in mind is that each filing system maintains its own CSD. This is a boon if you are swapping between systems, since when you return to any system you will find that the current directory has not changed since you last used it.

In next month's *Into the Arc* I will look at some of the practical problems which users experience when performing filing operations.

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An example may help clarify how the tools, the run-time and your application interact. Take menu handling. You create menus with the MenuEdit tool. You give each menu a name for easy identification. You link each menu item by name to a submenu, a pop-up window or an action. The run-time code pops up the right menu, in the right place at the right time when the user clicks the mouse MENU button. Before popping up the menu your application is informed to see if it wants to modify the menu. The run-time has functions to tick, untick, shade, unshade, change the text of a menu or its colours, etc. You just have to specify the menu's name and the item number you want to alter. The run-time also decodes and acts on the user's next step. If he chooses a menu item linked to an action then it calls a function in your application with the same name. You have to include such a function and write its contents to carry out the action.

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# Introducing C

## Part 9: Relocatable Modules

by Dec McSweeney

This is the final part of this introductory series on C. I hope you've all been paying attention because this time, after tidying up a couple of loose ends the major topic this month is the writing of relocatable modules in C, which is a great deal simpler than you might think. First, a word about compilation.

The C compiler is normally invoked by a command like this:

```
cc [options] filename
```

The compilation process consists of three phases, the pre-processor, compiler and linker. Acorn's ANSI C assumes the C source filename to be in sub-directory 'c'. The pre-processor searches various places including sub-directory 'h' for its header files, and passes its output directly to the compiler, which places the compiled output (prior to linkage) in sub-directory 'o'. The linker places the runnable output file in the current directory. All this may be changed under the control of various options.

Acorn has tried to adhere to the emerging industry standards in C, to the extent that most of the compiler options have the same format and behaviour as on UNIX systems. This is immensely useful for portability.

As you will remember, pre-processor commands are prefixed with a '#', and are executed during the compilation phase. This allows you to *#include* other files, and to *#define* constants. The pre-processor also recognises conditions and can act according to their truth value, a facility which is used to exclude or include other pre-processor commands or C program statements. Thus, a C source can contain two separate machine-dependent code fragments, and compile whichever applies at runtime:

```
#ifdef ARM
/** Archimedes-specific code */
#else
```

```
/** non-Arc code */
#endif
```

As you may have guessed, *#ifdef* is true if the word which follows has been *#defined*. The definition can take place in a *#include* file, or in the compiler invocation:

```
cc -DIRM c.date
```

Compilation of *c.date* in the above example would proceed as if the source contained the line:

```
#define IRM 1
```

and the following test evaluates true:

```
#ifdef IRM
#define MAX_MEM 640
printf("Next time buy an Archimedes!\n");
#endif
```

The Acorn C compiler automatically *#defines* ARM unless you "undefine" it. This can be done in the command line:

```
cc -UARM c.date
```

If you have access to a C compiler, you might find that the standard header files (*stdio.h* and so on) start and end with the following pre-processor directives to avoid any problems caused by multiple inclusion:

```
#ifndef STDIO
/** #ifndef is the "negative" of #ifdef */
#define STDIO 1
```

```
/** the entire include file follows here */
#endif
```

One other important feature of the pre-processor is *macro definition*. In part 5 of this series I mentioned that certain "functions" are defined as macros invoking other functions, for example:

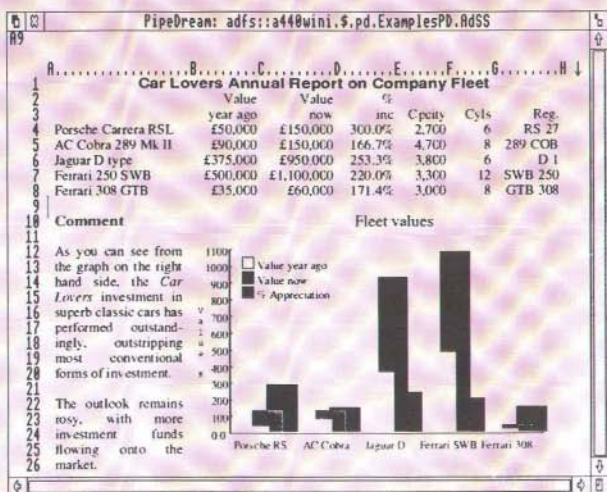
```
#define putchar(c) fputc(stdout, c)
```

A consequence of this facility is that you can write your own macros. Here is a classic example:

```
#define max(x, y) (x > y) ? x : y
```

Confused? I certainly was! This is an example of a ternary operator, that is one which involves three objects, rather than

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one (unary) or two (binary). The term to the left of the ? is evaluated, and if it is true, the expression evaluates to the term to the left of the colon (in this case *x*), otherwise it evaluates to the term to the right. Thus the macro reads "if *x* is greater than *y* then *x* else *y*". After this definition, any occurrence of:

```
max(a, b)
```

is replaced by:

```
(a > b) ? a : b
```

Note that *max* will work whatever *a* and *b* are; ints, pointers, floats or what have you. The compiler should warn you if they can't be compared (but don't rely on it - you're the programmer, you should know what you're doing!). Because it's a macro, it doesn't behave quite like a function; think about the result of *max(a++, --b)*. For all that, it's a very useful facility.

Having covered the pre-processor, you should now know enough about C to get programming. My final task will be to illustrate the writing of relocatable modules. Here for almost the first time, the information applies only to the Archimedes, and specifically to Acorn ANSI C release 3.

### RELOCATABLE MODULES IN C

Relocatable modules are programs written in such a way that they can reside anywhere in the computer's Relocatable Module Area. Many of the extensions to the operating system are written in this fashion, as you will see if you type the command *\*modules*. They behave in a way analogous to sideways ROMs on the dear old BBC B in that they can service star commands, and they can also be written to handle SWIs which the system doesn't recognise. Because they are held in a special area of memory, they won't be loaded in over your Basic programs and cause them to die. Hands up who tried using last month's *\*date* in a Basic program? What follows is for you.

A module must conform to certain standards which are laid down with commendable clarity in the Acorn C

manual. Briefly, it must contain a module header, entry and exit "veneers", "stubs" or entry points to the shared C library (rather than including chunks of library code in the program - much more efficient), and of course your code. To assist with the construction of the extra bits and pieces Acorn supply a utility *cmhg* which accepts text input and produces a linkable output file (the module header). Virtually all you have to do is compile your program and link it to the module header.

Your program must be adapted to relocatable module standards. The function which carries out any necessary initialisation must (if present) be declared to *cmhg*, as must the functions which actually do the work, and how they are invoked (e.g. the star command names). My module contains just one star command, "RM\_print\_date" (named to distinguish it from last month's program). Here is the *cmhg* file:

```
; file name : RM_header
; cmhg file for RM_date - comments start with ";"

; this appears when you type "help RM_date_module"
help-string: dec's_date_RMA 0.90

; this appears in the *modules list
title-string: RM_date_module

; this is the start-up function
initialisation-code: RM_date_init

; this tells cmhg we have re-runnable code
module-is-runnable:

; this is the function in the program
  which processes star commands
command-keyword-table: RM_date_cmd

; this is the star command list
RM_print_date(min-args:1, max-args:1,
  help-text: "Syntax RM_print_date
  'format string' (see PRM)")
```

The file is processed by *cmhg* thus:

```
cmhg RM_header o.RM_header
```

If no errors are found, the linkable output is placed in file *RM\_header* in directory 'o'.

The program itself now has an extra layer or 'veneer' inserted between the

functional parts and the outside world, consisting in this case of an initialiser and a command processor. The initialise function prototype is:

```
_kernel_oserror *RM_date_init(char *args,  
    int podule_base, void *reg_12);
```

The character array *args* contains the rest of the command line. This would allow you to select options on start-up. *Podule\_base* is set to 1 if the code was invoked from a podule, and the final argument is the 'r12' value obtained during module initialisation. This example, being trivial, does nothing here. The function should return NULL (zero) if it worked OK, otherwise a pointer to an error block (whose format is defined in *kernel.h*).

The command processor function prototype is:

```
_kernel_oserror *RM_date_cmd(char *arg_string,  
    int argc, int cmd_no, void *reg_12)
```

*arg\_string* is the remainder of the command line (in effect a concatenation of all the arguments), *argc* is the argument count, *cmd\_no* is the number of the command in the *cmhg* keyword list. It's up to the program to separate out its arguments, which is inconvenient but it allows the function itself to have a fixed number of arguments. In this example, *cmd\_no* will always be 0. If extra routines are added, this function will probably be amended to process them with a *switch(cmd\_no)* statement.

For the sake of space and simplicity I will not discuss the handling of SWIs which is very similar. I'm afraid I must refer you to the manual.

The entire program follows, largely unchanged from last month's version except for the two functions described above and the separation of the active code into the function *print\_date*. Comments are relevant to this month's topic.

```
/** RM date - print any portion of the **/  
/** "Time" message in any specified **/  
/** format using SYS &C1 (see PRM) **/  
/** Made in England by Dec McSweeney **/  
/** Converted to a RM format Feb 1991 **/
```

```
#include <kernel.h>
```

```
#include <stdio.h>  
#include <swis.h>
```

```
int print_date(char *fmt)
```

```
{  
    char pblock[5];  
    char outstring[150];  
    _kernel_swi_regs r;  
    int n;
```

```
    r.r[0]=14;  
    r.r[1]=(int)pblock;  
    pblock[0] = 3;  
    _kernel_swi(OS_Word, &r, &r);
```

```
    r.r[0]=r.r[1];  
    r.r[1]=(int)outstring;  
    r.r[2]=150;  
    r.r[3]=(int)fmt;  
    _kernel_swi(OS_ConvertDateAndTime, &r, &r);  
    for(n=0; outstring[n] >= ' '; n++)  
        ;  
    printf("%s\n", outstring);  
    return 0;  
}
```

```
_kernel_oserror *RM_date_cmd(char *arg_string,  
    int argc, int cmd_no, void *reg_12)
```

```
{  
    char *s = arg_string;
```

```
    /** Remove quotes around argument **/  
    /** argc will always be 1 because of the **/  
    /** cmhg line describing the function, **/  
    /** with the clauses min-args:1 **/  
    /** and max-args:1 **/
```

```
    if(*s == '"'){  
        while(*(++s) != '"' && *s >= ' ' )  
            ;  
        *s='\0';  
        s=arg_string + 1;  
    }
```

```
    else{  
        while(*(s++) >= ' ' )  
            ;  
        *s='\0';  
        s=arg_string;  
    }
```

```
    print_date(s);  
    return 0;  
}
```

```
int RM_date_init(char *cmd_tail,  
    int podule_base, void *reg_12)  
{
```

```
printf("initialising :");
return 0;
}

int main(int argc, char *argv[])
{
    printf("%s: Loading RMA\n", argv[0]);
    return 0;
}
```

The output string no longer terminates with a *newline*, since it's easier to add one if you want it than to remove it if you don't.

If you wish to preserve data between calls to the module, you must declare the variables as *static*, for example:

```
static char pblock[5];
```

This would allow you, for example, to read the system clock when the module is loaded and print the elapsed time between calls. In a less trivial example, you might read peripheral control codes from a file and store them. Static data types can be used in any C program and may be used to preserve values between successive calls to a function.

The program is compiled in (almost) the normal way. Because it must be linked to the *cmhg* header, the linking phase of the compilation is suppressed with the *-c* flag. Because it is a module, the static data must be treated separately, indicated by the *-zM* flag:

```
cc -c -zM c.RM_date
```

The output from the compilation, in the form of a linkable file, is in file *RM\_date* in directory 'o'. To link the two components, the linker is invoked with the flag *-rmf* to indicate the type of object code to be produced. The Shared C library stubs are also linked:

```
link -o RM_date -rmf o.RM_date o.RM_header $.CLib.o.stubs
```

When you load the module (by typing *\*RM\_date*), you will observe the output from the initialiser appears before that from *main()*. Don't ask me why, that's the way it is. Once the module is loaded, you can check by typing *\*modules* and *\*help RM\_date\_module*. If you type *\*help RM\_print\_date* you will get the reply

"Syntax RM\_print\_date 'format string' (see PRM)", just as specified in the *cmhg* file.

To invoke the date routine, type (for example):

```
*RM_print_date "%dy %mo %24:%mi"
```

You could even include it in a Basic program now:

```
format$="""%mo %c%t%e""":
REM must include the quotes
PRINTTAB(1,1)"Monthly sales report for ";
OSCLI("RM_print_date "+format$)
PRINT
*RM_print_date "Date : %dy/%mn/%yrTime : %24:%mi"
```

which would produce output of the form:

```
Monthly sales report for January 1991
Date : 31/01/91 Time : 16:34
```

If you wish to add more routines to the module, all you have to do is add your commands to the *cmhg* command list, insert your code in the C source, amend the command handler function and recompile.

Well, there you have it. I hope you've enjoyed this series; if your appetite for C is whetted may I recommend *The C Programming Language* by Brian Kernighan and Dennis M. Ritchie (2nd Edition). This is the standard work on the language by its designers. The tutorial section is first class and as a work of reference it is second to none.

I would also suggest that you study other C programs for hints on style and technique which could not be included in a short series such as this. Some RISC User advertisers include the C sources with their programs (beware: some of these sources are huge and are not always beautifully written, however well they might work). The forthcoming series on

Desktop programming in C will further demonstrate the power of the language and its suitability for serious work on the Arc family.

*Note: The BackDrop application described in this issue and featured on this month's magazine disc is written in C. For the interest of C programmers, the source code (as a text file) is also on the disc.* **RU**

## Software for

# ShowPage

ShowPage is a PostScript compatible interpreter running under RISC OS.

Over the last 6 years PostScript has established itself as an industry standard graphics programming language. Pioneered by Adobe for use in the original Apple laser printers, it is now used in all manner of output devices such as colour printers, and typesetting machines.

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ShowPage is fully multi-tasking and RISC OS compatible. It can read any PostScript file and output either to a window on screen, or to the currently selected RISC OS printer. It can therefore be used to make even the lowest cost dot-matrix printer PostScript compatible. When used in conjunction with LaserDirect, it can turn this printer into a very fast and fully fledged PostScript compatible laser printer.

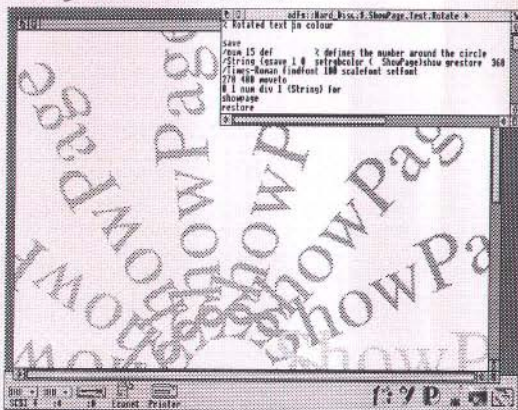
ShowPage supports the colour extensions and can create a sprite file of any required size. It can therefore be used to incorporate PostScript graphics into other RISC OS applications. It uses the RISC OS outline fonts, rather than the conventional PostScript fonts, for all

rendering, so it is compatible with the wide range of Archimedes outline fonts now available for this computer.

ShowPage has a simple built in editor allowing PostScript programs to be entered directly, and interactively with the results shown on screen in another window.

Showpage is compatible with the output from Acorn PostScript printer drivers. Minimum recommended memory is 2Mbytes.

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# the Archimedes

An equation building tool that complements many RISC OS applications, in particular DTP and word processor programs such as Impression and Impression Junior.

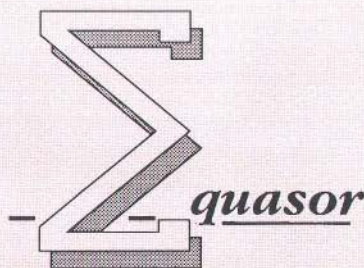
Many users of the Archimedes have a need to include complex mathematical formulae or equations into documents. Equasor allows equations to be built up on screen, graphically, from their component parts. Using the Acorn outline font system it presents a totally accurate view of the final equation at all times.

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Once the equation has been created it can be saved or exported to any number of compatible RISC OS applications. In DTP packages it can be dropped into frames just like any other drawing where it can then be scaled and positioned as required.

When used in conjunction with Impression II, it can take advantage of the latter's embedded frame capability to embed

equations into the text, even on the line. Once embedded in this way, the equation will then flow with the text as part of the text.

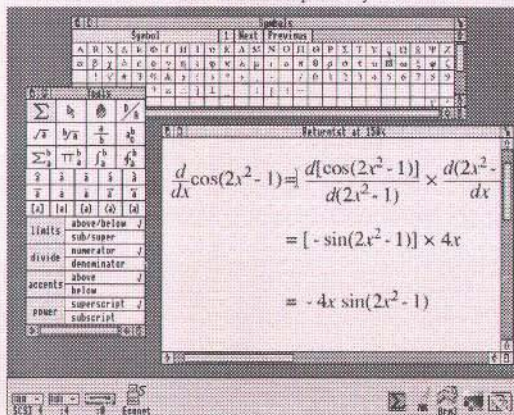


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# Hints & Tips... Hints & Tips

## PAGED SCROLLING

Lee Calcraft

You are probably aware that clicking on the arrow icons above or below the scroll bar of a window will scroll the window; and that by dragging the scroll bar you can scroll the window at great speed. However, you may not have spotted paged scrolling. If you click with Select or Adjust in the area above or below the scroll bar slider, the contents of the window will be displayed one page at a time (forwards with Select and backwards with Adjust).

## AUTOMATIC DATING IN C

Lee Calcraft

Following the ANSI standard, the macro names `__DATE__` and `__TIME__` (note that these are *double* underscores) are established by Acorn's ANSI C compiler, and hold the date and time of translation of the source code into object code (according to the Arc's CMOS clock).

As a handy example of the use of `__DATE__`, the following lines can be used to automatically insert the date of compilation in the ProgInfo dialogue box:

```
#define VERSION "0.5"
/* create dbx then use the following
*/
sprintf(version_string, "%s\\(%s)", VERSIO
N, __DATE__);
dbx_setfield(d, info_field, version_st
ring);
/* then use dbx_show as usual */
```

This assumes that `info_field` holds the field number of the version field to be written in the dbx, and that `version_string` has been declared as a character array large enough for the resultant string.

Using this code will result in a line similar to the following appearing in the ProgInfo dialogue box:

```
Version:          0.5 (Feb 18 1991)
```

## YET MORE USES FOR ADJUST

Richard Renwick

If you drag files using Adjust instead of Select, the files are copied as normal but the source window is closed after copying. If you start an

application by double-clicking with Adjust, the directory viewer will close after the application has started up. If you use Adjust to open a directory, the parent viewer will close as the new viewer opens. Finally, if you use Adjust on the close icon of a filer window, the window will close and its parent window will open.

## DUMP FORMAT

Alan Wrigley

If you \*Type a text file containing a vertical bar character ("|"), you will normally see two vertical bars instead. This is because the DumpFormat setting, which determines how control characters are displayed using \*List and \*Type, uses GSTRans format by default. Since the vertical bar is used by OS\_GSTRans to flag a special character, in order to obtain the bar itself it must be preceded by a second bar (see the PRM pages 580-581 for more details). To \*Type a file without vertical bars being doubled up, first issue the following command:

\*Configure DumpFormat 5

Control characters will no longer use GSTRans format, and the bar will revert to an ordinary ASCII character. For more information on this command, see page 292 of the User Guide.

## WIMP BUG?

Lee Calcraft

You may have noticed that, in Edit for example, if you have a long file, you cannot display the bottom of it by dragging the scroll bar slider to the base of the window, though you can reach the top by dragging upwards. This appears to be a bug in the Wimp. The simplest way to display the bottom of the window in such cases is to drag the scroll bar slider as far as possible, then click Adjust repeatedly with the pointer somewhere above the slider. This uses the paged scrolling described above, but in the reverse direction (since Adjust is used).

## DRAW HINTS

Dr T.P. Dawson

There are a number of undocumented facilities available in Draw. For example, the cursor keys can be used for accurate positioning of objects and points. While keeping Select pressed and the mouse still, the cursor keys may be used to move the pointer one pixel at a

# Hints & Tips... Hints & Tips

time. Furthermore, by using a negative value in the *X scale*, *Y scale* or *Magnify* options from the *Select* sub-menu, selected objects can be reflected horizontally or vertically. This is useful for producing symmetrical objects.

## FONTS AND FORMED

John Ferguson

If you use FormEd on a system with a large number of fonts, you may get a "Menu area full" error. This is easily rectified by editing FormEd's !RunImage program. Load the program into Basic and increase the dimensions of the arrays *menufree%* and *menuend%*. These are located at line 790 in versions 1.01 and 1.02 (as supplied on the Vol.4 Issue 3 magazine disc). They are currently DIMmed to &1800, and you may need to experiment to find a suitable new value, but increasing them to &2000 clears the error condition on my system with 61 fonts.

## PROGRAMMING FUNCTION KEYS

A. Phillipson

It is possible to include the definition of one function key in the definition of another. For example, if you type *\*Key 1 testing* followed by *\*Key 2 just <Key\$1> again*, you will now find that F1 produces the word "testing", while F2 displays "just testing again". Note the use of the system variable *Key\$1* which holds the current value of F1 (you can type *\*Show Key\$\** to see all the keys). However, if you now redefine F1 with, for example, *\*Key 1 waiting*, you will find that the definition of F1 has changed but that of F2 has not. This is because the variable *Key\$1* was evaluated at the time F2 was defined. In order to ensure that the definition of F2 always reflects the current value of F1, use:

```
*SetMacro Key$2 just <Key$1> again
```

This causes *Key\$1* to be evaluated whenever F2 is pressed.

Finally, to get rid of all the function key definitions, type:

```
*Unset Key$*
```

## DISPLAYING TELETEXT FILES

J.V. Parker

With a BBC micro and a teletext adaptor you can display a teletext (i.e. viewdata) file simply

by using *\*Print* while in mode 7. This also works on the Archimedes but not from the Desktop. The following three-line application overcomes this. Open a new directory called *!TTXPrint* or whatever, and include just one file in it, called *!Run*. This should be an Obey file (which can be created with Edit) and should contain the following lines:

```
Echo <22><7>
```

```
Echo <14>
```

```
Print %*0
```

Use TinyDirs to install the application, by dragging the !TTXPrint icon from its viewer onto the TinyDirs icon. Dragging any viewdata file to the !TTXPrint icon will then display that file in mode 7.

## MORE ON DRAW

Dietmar Haltermann

It is impossible to grab and move single thin lines in Draw if they have been locked to the grid (though it appears to be possible to do so with lines created without the grid). However, if you draw a small rectangle or circle near the offending line and group the two together, you can then move the group, and delete the unwanted addition afterwards.

To draw a part arc or circle, first draw a full circle in an otherwise unused colour. Move this close to where the arc is to be, draw a curve and adjust it to follow the circle's shape.

RU

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## BOOKS?

*Many thanks for your reply to my letter on error handling published in the October issue of RISC User (Volume 3 Issue 10). Now that BEEBUG has published its first book **File Handling for All**, why not take the bull by the horns and publish another book on error handling? I am sure you can dig up enough material on this vast subject to fill another book.*

**Jesse Luxton**

We are very pleased with the response to our first publishing venture *File Handling for All*, and the associated disc, and we are investigating the publication of further books more specifically related to the Archimedes. We will certainly consider Mr. Luxton's suggestion, and any others which we receive.

## CALL FOR A MULTI-LINGUAL ARC

*Can someone please explain to me the lack of compilers on the Archimedes for a number of modern programming languages. The range available is limited and has been static for some time.*

For example, it is well known that Acorn produced a Modula-2 compiler as part of the ARM development route, but this has never appeared as a product, yet Modula-2 is available on most competitive systems. Another language which is rapidly becoming a standard for the development of new software is C++. Can we expect an Arc version in the foreseeable future?

*If the Arc is to continue as a relevant, serious system, it will need a larger range of software, including all the relevant compilers.*

**Steve Perkins**

I am sure that if Acorn had thought that there was a viable market for a Modula-2 compiler they would have made the additional investment needed to bring this to the market place. But let's be quite clear, a good compiler is a highly complex and sophisticated piece of software, and doesn't come cheap. Apart from

a small number of main stream languages (Basic, C, Fortran, Pascal), most languages are for the minority of users only, and the size of the Archimedes market (which is essentially still UK-based at present) does not justify such a specialised product as is possible with the much larger world-wide market for the PC (and compatibles).

However, Acorn has sold over 100,000 Archimedes, much new software has recently appeared, and the Acorn market has reached a size where many more potential products should become commercially viable - Acorn is believed to be giving C++ some thought. Compilers will still remain something of a specialised market though - maybe there is scope here for public domain software to fill the gap.

## AND MORE BOOKS

*Four months ago I started subscribing to RISC User, and since then I have found it both informative and interesting. About six months ago I upgraded from a BBC Master to an A3000. Although I can program quite well in Basic IV, I know that there have been some new commands in Basic V. Please could you recommend a good easy-to-follow guide to this version of Basic?*

*I would also like very much to learn how to program in machine code on the Archimedes. I have no knowledge of machine code, as well as and would very much appreciate it if you could recommend a step-by-step guide to this subject.*

**Tom Skelley**

Dabs Press publish a book on Basic V, called unsurprisingly *Basic V*, which costs £9.95. There is also a Dabs book on assembly language programming for the Archimedes, called *Archimedes Assembly Language* at £14.95 (both books are available from BEEBUG - see retail catalogue). This is aimed at beginners to machine code, as well as experienced programmers, and should be suitable. See also our series *Introducing ARM Assembler* in RISC User Volume 1 Issue 5 to Volume 2 Issue 3.

**RU**

# Personal Ads (free to members)

**BEEBUG Archimedes serial link** £11, W.E. 40/80T 5.25" DD £79, W.E. DD Interface £11, BEEBUG DD Interface £22, Acorn I/O Podule £61, View for Arc. £20, Snap camera, software and manual for BBC £20, C Dab Hand Guide £8. All items hardly used. Tel. (0494) 764804 after 7pm.

**French student looking for other A3000 users** to exchange ideas, softs and PD. Answers to all. Write to; Mr L Domisse, 3 Square Hector Berlioz, Appt 102, 60200 Compiègne, FRANCE.

**Archimedes PC Emulator** new, unregistered, also BBC Basic Guide £60. Tel. (0673) 843413.

**Kaga Taxan printer** KP-810, NLQ with spare ribbons, manuals and paper £99. Tel. 081-445 7875.

**Epson LQ-850 & Cut Sheet Feeder** with accompanying manuals, in very good condition, all with original packing, two years old, brand new head, hardly used. Selling purely because have upgraded £450 o.n.o. Tel. (05242) 61321.

**Archimedes 310 (colour)** with 40M disc drive, backplane, fan £925. Archimedes colour 8Mb R140

with 50Mb disc drive £1800, will split both, also Ethernet card £100, Panasonic KX-P1124 printer £140, Linnet V21/23 modem £70, A3000 Midi Expansion card £30, Geniscan A5 mono scanner £95, Knowledge Organiser £30, Rhapsody £35, Interdictor I £10, Arcwriter £10, Superior Golf £10, magazines and shareware discs £1 each. Tel. (04867) 80632.

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## RISC User Back Issues

Please note that we have now reprinted issues 3-1 and 3-4 of RISC User, so that all copies of volume 3 are now available as back issues (see inside back cover for prices). All outstanding orders for the above two issues have now been sent out, and any new orders can be satisfied from stock.



# Technical Queries

---

Dear Sir,

*Text files in my possession (Edit files) respond as they should when their directory icons are double-clicked, and to the commands \*TYPE and \*DUMP. What is more difficult to follow, for a programmer familiar with the BBC model B, is the system used by the Arc for storing files in memory.*

*For example, I have a text file just under 700 lines in length. After double-clicking on its icon, I search memory using the RISC User Toolbox \*SEARCH command. I can find the first 126 lines of text, then there is a gap in memory until I can locate lines 294-698, but I cannot find the missing 168 lines.*

*In addition, with mode 7 on the model B, it was a simple matter to load a memory location with the value 42 to display an asterisk on the screen. Search as I may, I have never found a memory location on the Arc which will similarly oblige.*

**Jim Jameson**

Memory management is much more sophisticated on the Arc than on the old BBC micro. To understand this you need to appreciate the difference between physical memory and logical memory. Logical memory is the memory (address space) seen by all the software (including RISC OS). Any references to memory locations, and this applies to Toolbox commands, will be to locations in this imaginary memory. But it doesn't really exist. Instead, the logical address space is mapped by MEMC (the memory controller chip) onto the physical address space which is the real memory of the computer. This arrangement explains the meaning of the error message "Address exception at ...." which sometimes appears. Through some error, an address in logical memory fails to translate into a real memory location.

Furthermore, the use and allocation of logical memory is not fixed but handled dynamically. Indeed, applications themselves, if well written, can claim extra memory as needed, and return surplus memory to a 'free' pool as appropriate. It is therefore impractical, on the whole, for

user programs to attempt to address fixed memory locations directly, as could be done on the model B. Everything should be channelled through appropriate SWI calls, or addressed relative to some dynamically allocated base address (as with the use of indirection operators).

Because RISC OS is multi-tasking, quitting one task does not guarantee that any (virtual) memory used by that task will remain as it was. Thus using another piece of software to search memory for text loaded by a previous application may well fail, as it is quite feasible that some or all of that memory will have been re-used.

In addition, much depends on how the software which loads the text in the first place manages its use of memory. For example, Edit will normally store any text in memory as two separate chunks with a gap in between. This space is dynamically located at the point in the text where new characters are to be entered by the user. This approach minimises the movement of text and helps to speed up processing.

Finally, mode 7 is only emulated on an Arc, whereas there is a special teletext decoding chip in the Beeb. All text on the Arc is displayed by creating a bit image of each letter's shape in the corresponding screen memory position. To emulate mode 7 the Arc maintains a 1K area of memory equivalent, if you like, to the BBC micro's 1K of mode 7 screen memory. Each teletext character stored in this area is converted into a corresponding bit-image character in the appropriate position in the Arc's currently allocated screen memory. However, just inserting a new code into this pseudo mode 7 screen memory would not affect the Arc's screen display, unless you were able to invoke the functions which generate the corresponding bit image on screen.

At the end of the day, the point to be made is that in this and in many other ways the Arc is a vastly different machine from the old BBC micro, despite many superficial similarities. Treat your machine as the grown up Arc it is, rather than applying the ideas you used in your BBC micro youth.

**Mike Williams** *RU*



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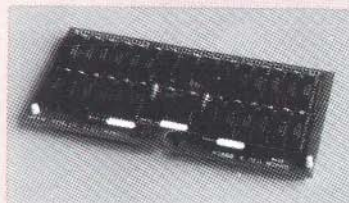
## FURTHER INFORMATION

A catalogue of our products is currently available. Please call or write if you require this or further information on any A3000 or Archimedes product.

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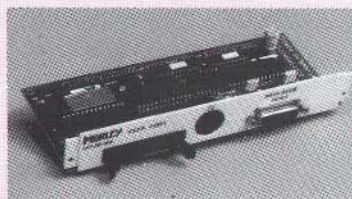
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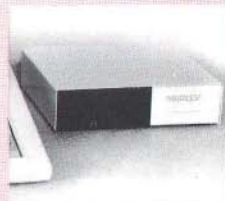
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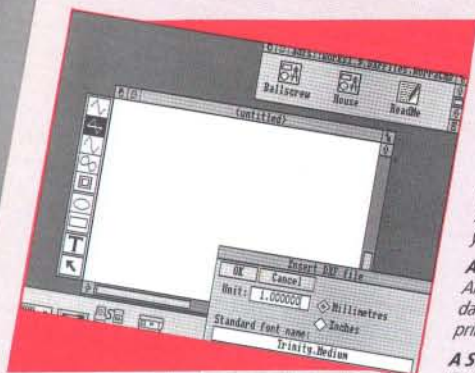
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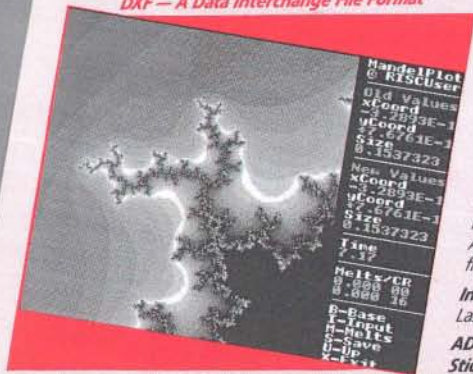
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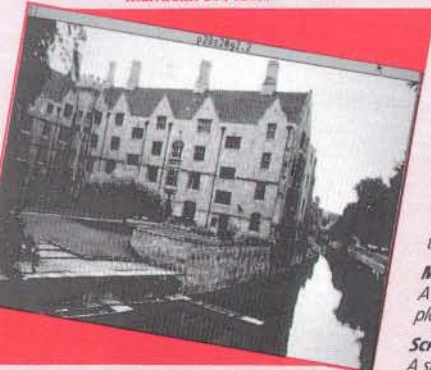
# RISC USER MAGAZINE DISC CONTENTS



**DXF — A Data Interchange File Format**



**Mandelbrot Plotter**



**Screen Image**

## **PROGRAMS IN RISC USER APRIL 1991**

### **DXF — A Data Interchange File Format**

Examples of DXF files which can be imported into Draw.

### **Teletext for Accurate Time Keeping**

Download the correct time from Teletext (using Ground Control's Teletext adaptor), and improve the accuracy of the Archimedes clock with this program offered in Assembler and in Basic.

### **Creating a Boot Application**

A sample IBoot application which will automatically install any applications of your choice, open viewers, and which can be tailored to your own requirements.

### **Added Filing Functions with Filer**

An application which allows you to timestamp a file with the current time and date, set the file type from the Desktop and to open Filer windows for the printer and serial ports.

### **A SWI Name Finder**

Two short utilities: the first one offers the SWI name when entering a SWI number; and the second generates a scrolling display of all SWI calls known to the computer at the time of running.

### **Programmer's Workshop**

An extended version of the Dedit program, which enables you to examine disc contents in both ASCII and hex formats, and provides some useful additional features.

### **Mastering the Wimp (Part 17)**

Two procedures PROCdraw and PROCprint for accessing the printer drivers and printing text and graphics.

### **B\_to\_T Revisited**

An enhanced version of the B\_to\_T utility, which enables you to convert Basic files into text, and vice versa, for easy editing within the Desktop.

### **Introducing C (Part 9)**

Last month's program adapted as a relocatable module.

## **ADDITIONAL PROGRAMS DESCRIBED IN THE MAGAZINE**

### **Sticky BackDrop**

A very versatile implementation of the sticky backdrop concept, which allows you to stick file and directory icons onto the Desktop for quick access. The disc includes the C source file, and a sprite which can be used as a backdrop.

### **BONUS ITEMS**

#### **Disassembler**

A useful Wimp program which enables you to disassemble ARM code program files in a multi-tasking window.

#### **Character Editor**

A Desktop application which allows you to design and edit system fonts.

#### **Show Mouse**

This application changes the shape of the pointer into a mouse replica to display the state of the mouse buttons. Ideal for demonstrations and tutorials.

#### **Mandelbrot Plotter**

A superfast Mandelbrot generator which uses Mariani's algorithm to produce a plot in under 2 seconds.

#### **Screen Image**

A stunning picture of a Cambridge college which, when displayed on a multi-sync monitor, shows just what the Arc is capable of.

# Special Offers to RISC User Members April 1991

Each month RISC User will include a list of special prices for BEEBUG's own Archimedes software, available only to RISC User members.

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| PAOM  | ArcOmnibus Games                                        | 9.95           |         | 0106c | Hard Disc Companion         | 35.00          |         |
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| 1410a | RISC User Movie Maker                                   | 4.75           |         | 0107c | ISO C Development System    | 79.00          |         |
| 1401a | RISC User Toolbox (Arch.)                               | 5.75           |         | 0100c | Masterfile Archimedes       | 16.50          |         |
| 2420b | RISC User Binders                                       | 4.20           |         | 0111b | Outline Font Pack 1         | 49.50          |         |
| BK01b | File Handling for All book and disc                     | 11.95          |         | 0108d | Ovation (Beebug DTP)        | 99.00          |         |
| BK02b | File Handling for All book                              | 9.95           |         | 0796c | Serial Link                 | 17.25          |         |
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